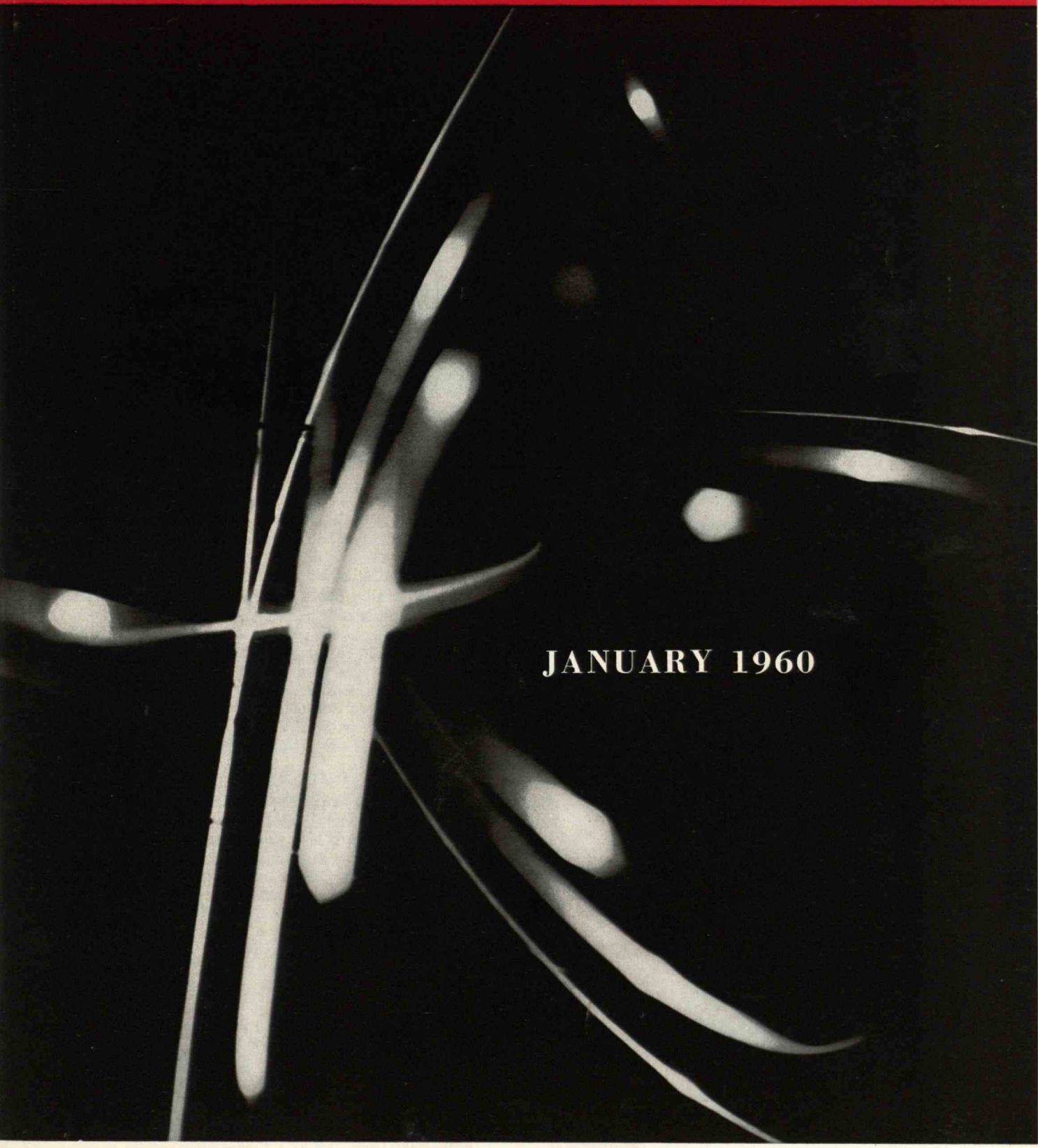
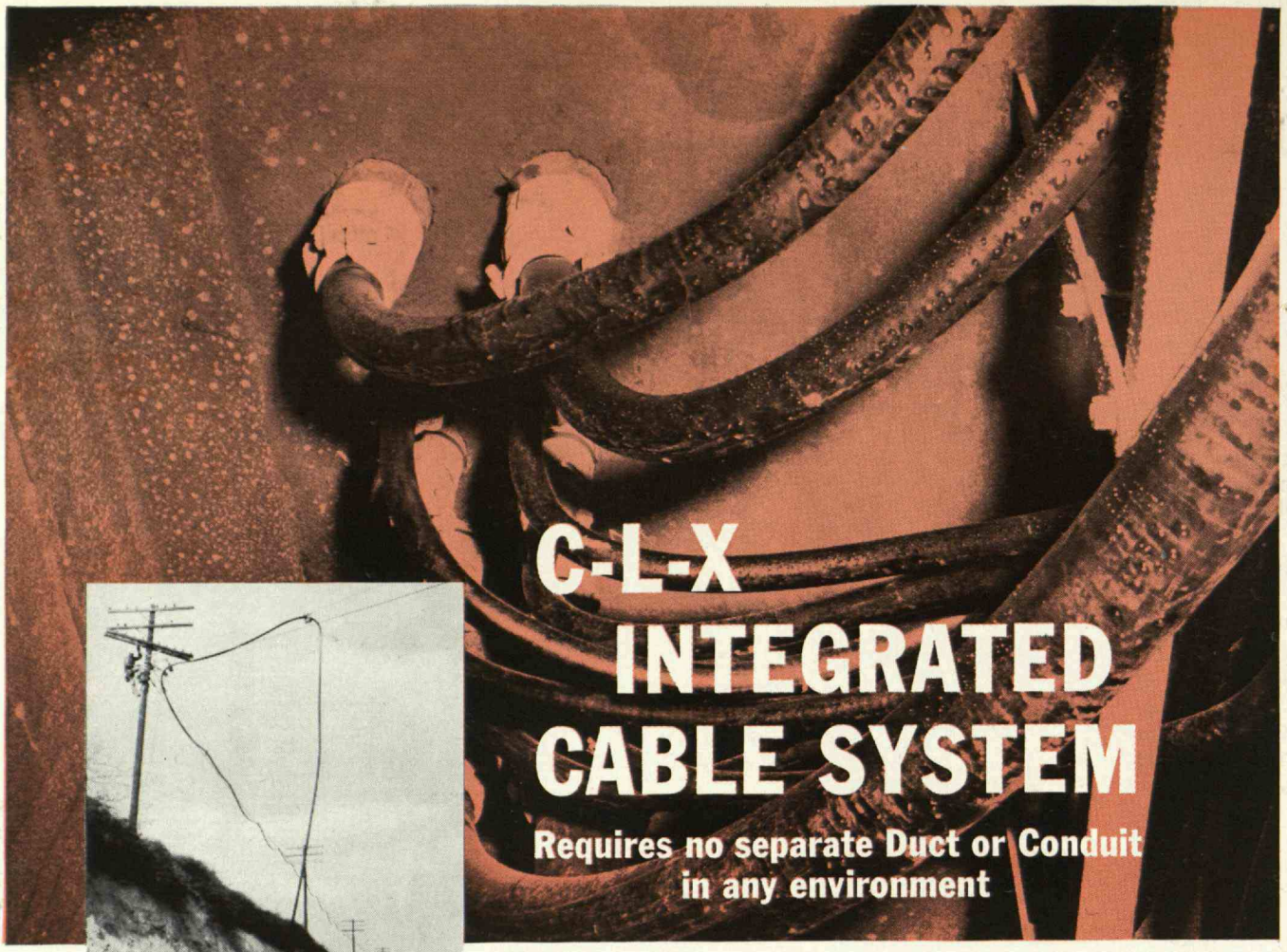
Technology Review



JANUARY 1960

In this issue: James R. Killian, Jr., Otto Struve, Walt W. Rostow

technology
review
Published by MIT



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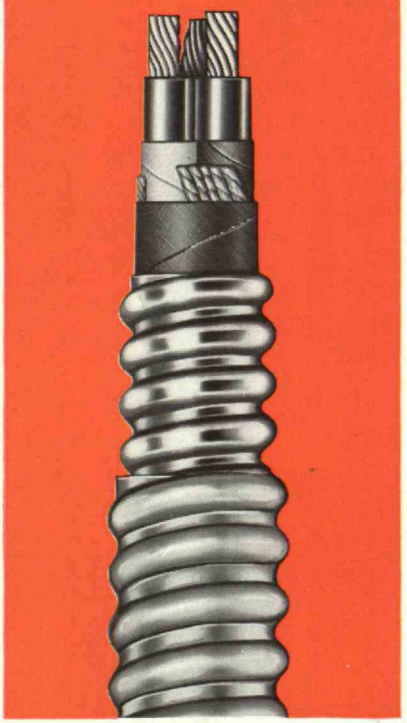

The revolutionary C-L-X Continuous, Corrugated, Lightweight, metallic sheath, that Simplex introduced to this country two years ago, is now available in *Aluminum*, *Copper* or *Bronze* as well as the enormously successful *Steel*.

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1st in Availability. Tooling for most types is in existence. Flexibility of design cuts lead time on other types.

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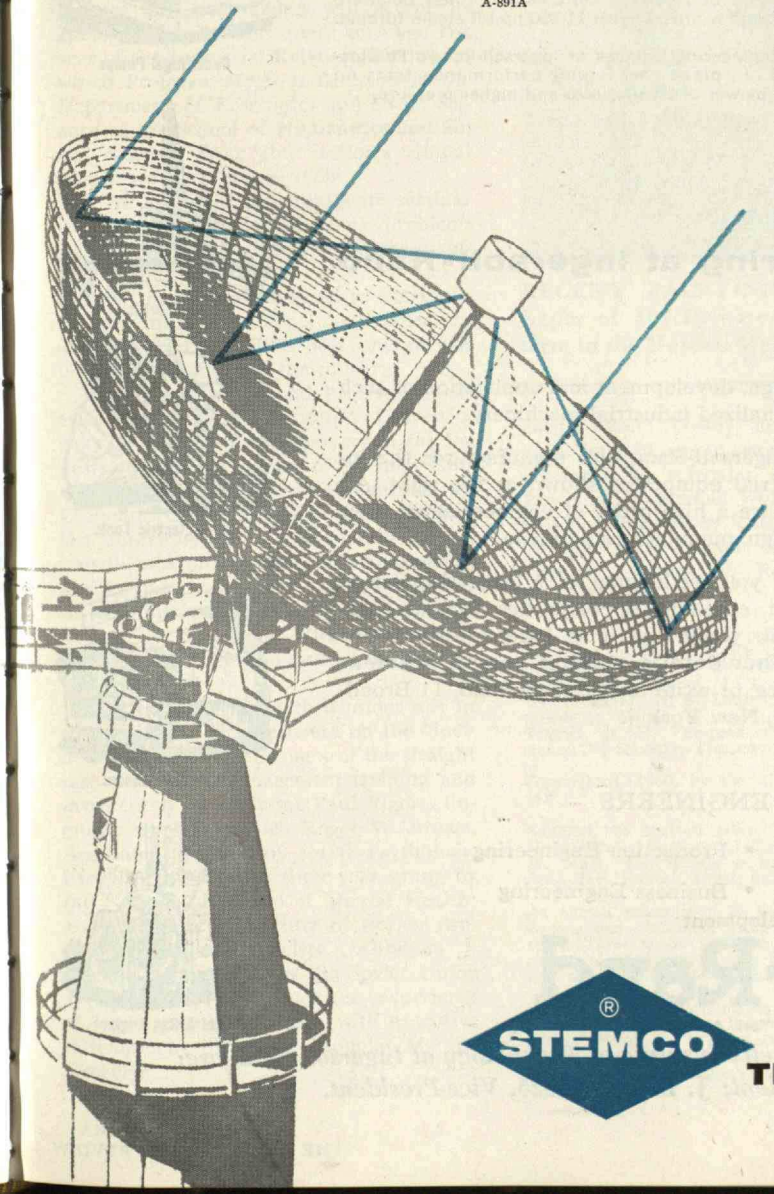

TYPE A* semi-enclosed. Bimetal disc type snap action thermostats; give fast response to temperature changes. Can be made to open on rise or close on rise. Single-throw with double make and break contacts. Operation from -20 to 300°F. Lower or higher temperatures on special order. Average non-inductive rating 13.3 amps, 120 VAC; 4 amps, 230 VAC and 28 VDC. Various mountings and terminals available. Bulletin 3000.

TYPE A hermetically sealed. Electrically similar to semi-enclosed Type A. Various mountings, including brackets, available. Bulletin 3000.

TYPE MX hermetically sealed. Snap acting bimetal disc type units to open on temperature rise. 2 to 6°F differentials as standard. 1 to 4°F differentials available on special order. Depending on duty cycle, normal rating 3 amps, 115 VAC and 28 VDC for 250,000 cycles. Various terminals, mountings and brackets available. Bulletin 6100.

TYPE MX semi-enclosed. Construction and rating similar to MX hermetically sealed type. Bulletin 6100.

TYPE M hermetically sealed. Bimetal disc type, snap acting thermostats. Also available in semi-enclosed. Operation from -20 to 300°F. Lower and higher temperatures available on special order. Depending on application, rated non-inductive 10 amps, 120 VAC; 3 amps, 28 VDC. Various terminals, wire leads and brackets available. Bulletin 6000.

TYPE C hermetically sealed. Also semi-enclosed styles. Small, positive acting with electrically independent bimetal strip for operation from -10 to 300°F. Rated at approximately 3 amps, depending on application. Hermetically sealed type can be furnished as double thermostat "alarm" type. Various terminals and mountings. Bulletin 5000.

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Technology Review

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Volume 62, Number 3 *Edited at the Massachusetts Institute of Technology* *January, 1960*

Feedback

News We Missed in 1959

FROM CHARLES A. MYERS:

While I have been at home following three weeks in the hospital as a result of a fractured vertebra, I have read with great interest the last issue of The Technology Review. I thought the article on Dr. Struve was very good; I also was struck by the article on the Center for International Studies.
M.I.T., Cambridge

THE REVIEW hopes Professor Myers, his associates and our readers will accept its apologies for its inadequate coverage last year of the Industrial Relations Section, of which Professor Myers is Director, in the Department of Economics and Social Science of the School of Humanities and Social Science. From this section's annual report, we learn that in 1959:

1) An advanced undergraduate seminar in special industrial relations problems was added to the subjects taught by members of the section.

2) In the program leading to the Ph.D. in economics, 16 students emphasized industrial relations. This was one of the largest such groups in the country.

3) Professor Myers and Professor Frederick Harbison of Princeton University were co-authors of *Management in the Industrial World* (a product of the Inter-University Study of Labor and Management in Economic Growth), which was published last September. It is an analysis of the growth and philosophies of management, and includes case studies of management in 13 countries. Ralph C. James, Jarold G. Abbott, '58, and David Williams of M.I.T. were among those who assisted the authors with this book.

4) A variety of research is under way in the section. It includes work on the "incident process" (a refinement of the straight case method in management training and instruction) by Professor Paul Pigors; linguistic work for which Roger W. Brown, Associate Professor of Social Psychology, has been awarded a three-year grant by the National Institute of Mental Health; and studies of the nature of worker protest in industrial society (Abraham J. Siegel), management in the Soviet Union (Ralph C. James), and the experience of leading American firms with executive development programs (Douglas M. McGregor).

RECENT PAINTINGS by Gyorgy Kepes of M.I.T. were exhibited this term in the Hayden Memorial Library.

EDITOR: Volta Torrey; BUSINESS MANAGER: R. T. Jope,'28; CIRCULATION MANAGER: D. P. Severance,'38; EDITORIAL ASSOCIATES: J. J. Rowlands, Francis E. Wylie, John I. Mattill; EDITORIAL STAFF: Ruth King, Diana de Filippi; BUSINESS STAFF: Madeline R. McCormick, Louise E. Ryan; PUBLISHER: H. E. Lobdell,'17.

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This Month

The Cover

Experimental work in light and color classes in the M.I.T. School of Architecture was exhibited recently in the IBM Gallery in New York. Michael B. Flint, '59, and Franklyn Williams, '59, did the painting with light that is this month's cover.

Individuals Noteworthy

E. L. Cochrane: 1892-1959

M.I.T.'s Vice-president for Industrial and Governmental Relations, Emeritus, Vice Admiral Edward Lull Cochrane, '20, died on November 14 in New Haven, Conn. He was one of the leading naval constructors and administrators of our time.

As Chief of the Bureau of Ships during World War II, he directed the building of our wartime Navy. Later, at M.I.T., he made outstanding contributions to defense, to public service, and to education.

Admiral Edward L. Cochrane

Born at Mare Island, Calif., in 1892, he was graduated "with distinction" from the United States Naval Academy in 1914. Several years later he was assigned to M.I.T. for advanced work in naval construction, and in 1920 he was awarded his master's degree. For the next 20 years he held various naval posts.

He was named Chief of the Bureau of Ships with the rank of Rear Admiral in 1942, became Vice Admiral in 1945, and the following year was appointed Chief of the Navy Materiel Division of the Office of Assistant Secretary. In 1947 he was named to the President's Advisory Committee on Merchant Marine, and in that same year he retired from active duty to assume the position of head of the Department of Naval Architecture and Marine Engineering at M.I.T.

In 1950 the President appointed him chairman of the Federal Maritime Board and Maritime Administrator in the Department of Commerce, with responsibility for beginning construction of the new Mariner-class fast freighters and for setting up the National Shipping Authority. In 1952, Admiral Cochrane returned to M.I.T. as Dean of the School of Engineering, and in 1954 he was appointed vice-president. He was a Special Adviser to the President at the time of his death.

Admiral Cochrane was awarded the David W. Taylor Gold Medal and made an Honorary Knight Commander of the Military Division of the Order of the British Empire in 1945, and received the Navy's Distinguished Service Medal in 1946. He was a member of the National Academy of Sciences, a Fellow of the American Academy of Arts and Sciences, past President of the Society of Naval Architects and Marine Engineers, and an Honorary Member of the British Institution of Naval Architects and the British Institute of Marine Engineers.

He is survived by his wife, the former Charlotte Osgood Wilson, and two sons, Captain Richard Lull Cochrane, '47, and Commander Edward Lull Cochrane, Jr., both of the Navy. Burial was in the Arlington National Cemetery.

Dr. Bolt's New Post

ON JANUARY 1, Richard H. Bolt, who has been at M.I.T. since 1945, became associate director of the National Science Foundation. Dr. Bolt, who has been director of the Acoustics Laboratory and professor of acoustics in the Department of Electrical Engineering, received a leave of absence to assume the new post, but will continue to

Richard H. Bolt

live in Lincoln, Mass. He will succeed Robert B. Brode of the University of California (Berkeley) and be responsible for the Foundation's activities in support of basic research in science.

Dr. Bolt was born in Peking, and educated at the University of California. During World War II he served as scientific liaison officer with the London branch of the Office of Scientific Research and Development, and as chief technical aide to Division 6 of the National Defense Research Committee with offices in New York City. He received the Acoustical Society of America's biennial award in 1942, and was its president in 1948.

He is principal consultant to the Biophysics and Biophysical Chemistry Study Section of the National Institutes of Health, and a member of the Committee on Operating Problems of the National Aeronautics and Space Administration. He also is a Fellow of both the American Physical Society and the American Institute of Physics.

Honors to Alumni

SPECIAL honors and awards to Alumni reported since the December issue of The Review went to press included:

To *Professor Emeritus Joseph C. Riley, '98,* an A.S.M.E. gold 50-year pin . . . to *Claude E. Patch, '02,* an award for his contributions to the Technical Association of the Pulp and Paper Industry . . . to

(Continued on page 6)

Individuals Noteworthy

(Continued from page 4)

Charles F. Cellarius, '16, an honorary doctor of humanities degree, August 26, 1959, from Miami University, Oxford, Ohio . . . to *Charles S. Draper, '26,* the Magellanic Medal of the American Philosophical Society . . . to *Harry Wexler, '39,* the Distinguished Public Service Award, for his contributions to the Department of the Navy's mission in the U.S. Antarctic Program during the International Geophysical Year . . . to *Neil Burgess, '41,* the Collier Trophy for 1959.

A Busy Chairman

WHEN Dr. James R. Killian, Jr., '26, returned full time to M.I.T. last summer as Chairman of the Corporation, he did not slacken the pace which he had maintained for a decade as President and nearly two years as Special Assistant for Science and Technology to President Eisenhower.

In addition to his duties at the Institute, Dr. Killian continues to serve on Mr. Eisenhower's Science Advisory Committee. He has returned to the chairmanship of the Institute for Defense Analyses, an organization sponsored by M.I.T. and other universities to apply analytical methods to military problems. He is also a member of the Secretary of State's Advisory Committee on Disarmament, and has resumed the presidency of Atoms for Peace Awards, Inc. (which gives a $75,000 award each year to a leading scientist), and the chairmanship of the Board of Trustees of the Nutrition Foundation.

Dr. Killian also has become a trustee of the Boston Museum of Science and a member of the board of General Motors Corporation and International Business Machines. He has been nominated to be moderator of the American Unitarian Association and he was chairman of the Christmas Seal Campaign for Cambridge.

In November, Dr. Killian received the Distinguished Achievement Medal of the Holland Society of New York. He has spoken often before student groups and other gatherings.

(Continued on page 8)

It takes five jet engines, not four... to get a jet airliner airborne.

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Individuals Noteworthy

(Continued from page 6)

Louis S. Cates: 1881-1959

A LIFE MEMBER, Emeritus, of the M.I.T. Corporation, Louis Shattuck Cates, '02, died last October 29. He was president of the Phelps Dodge Corporation from 1930 until 1947, and had been chairman of its Board since then.

Mr. Cates became a timekeeper in the mining fields of Utah after his graduation from M.I.T. and rose to become one of the great figures of American copper mining and refining, responsible for important engineering innovations and many important business transactions. He was the 1938 William L. Saunders Gold Medalist of the American Institute of Mining and Metallurgical Engineers, and had served M.I.T. in many ways.

He is survived by his wife, Mrs. Ethel Cates; a daughter, Mrs. Norbert A. Bogden; three grandchildren and a great grandchild.

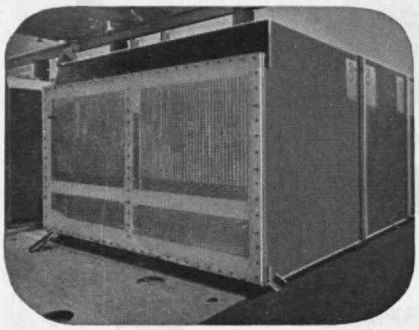
From M.I.T. to Harvard

NEXT JULY 1, Erik H. Erikson, who was a visiting professor at M.I.T. last year, will become professor of human development and lecturer in psychiatry at Harvard.

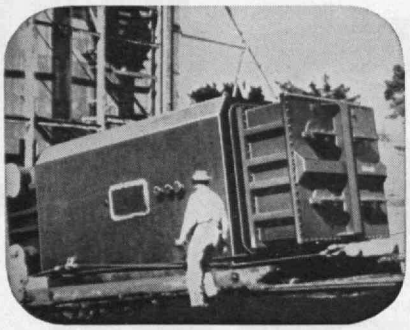
(Continued on page 42)

and auxiliary equipment

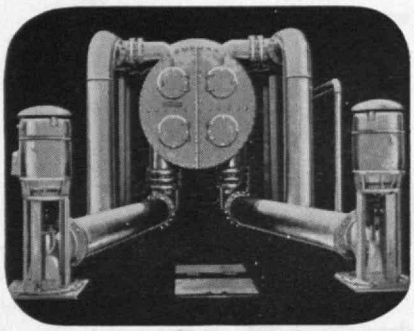
HOW C.H. WHEELER CONDENSER DESIGN saves space...



Head Room problems are solved by compact condensers like this one. Turbine floor to basement floor, in this case, is only 20 ft. The Unit has 65,000 square feet of condensing surface.

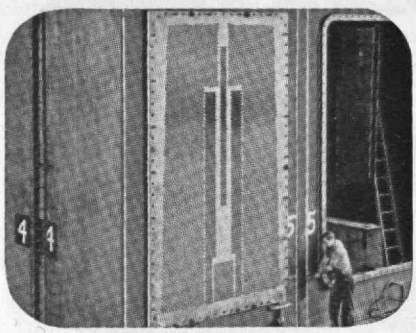


Rectangular Cross Section makes C.H. Wheeler Condensers adaptable to nearly any space or condenser arrangement because the length, width and height of any Wheeler Unit can be varied almost at will.

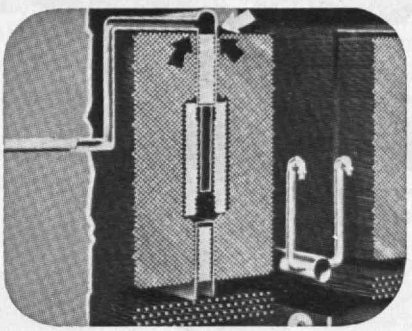


But Wheeler Doesn't limit itself to rectangular design. A round cross section worked out better here, for example, at the first planned gas-steam turbine station ever designed and built in United States.

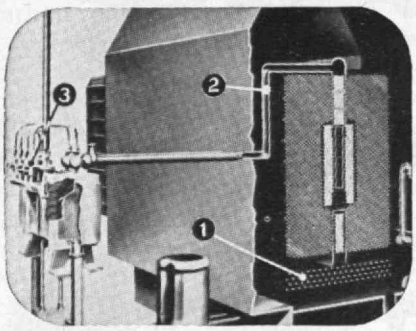
improves power generating efficiencies...



Triple Lane tube layout, another design feature, provides 3 pathways for steam travel, utilizes maximum cooling surface and produces higher condenser vacuums for power generating stations.

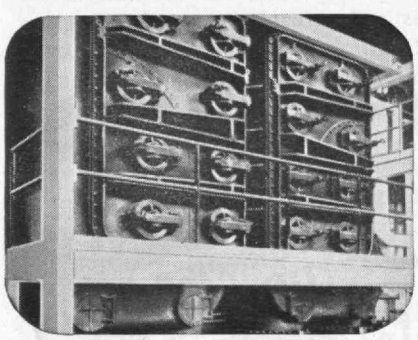


Location of air-vapor takeoff speeds steam travel and allows steam to penetrate to the peripheries of all tubes. It thus improves condenser efficiencies and overall power station operation as well.

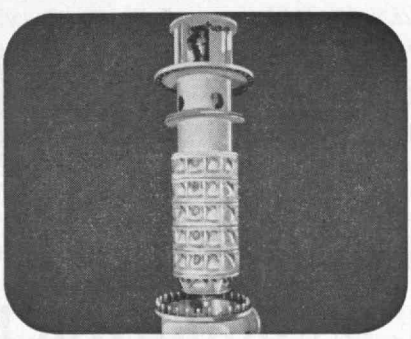


Deaeration of condensate not to exceed 0.01 cc. oxygen/liter is available with special Wheeler designs. Note the Deaerating Bars (1), the Air-Vapor Suction Line (2), and Tubejet® Ejectors (3).

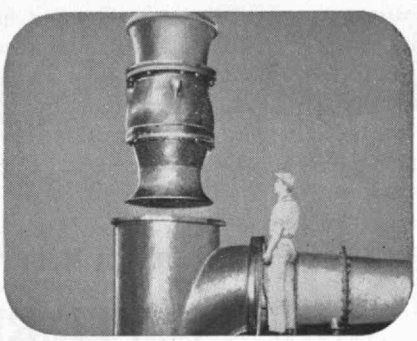
and reduces maintenance



Patented Reverse Flow permits flushing tubes and sheets without shutting down Unit, during full load with either or both circulating pumps operating. No additional circulating water inlet or discharge piping necessary with C.H. Wheeler's Reverse Flow.



"Pull-Out" Condensate Pumps simplify maintenance because entire pumping element, including all rotating parts, can be removed without disturbing either the pump barrel or the piping connections.



C. H. Wheeler Circulating Pumps, like Condensate Pumps, are easy to inspect and maintain because of "Pull-Out" design. In addition, shafts are heat treated alloy steel and impellers are statically and dynamically balanced for trouble-free operation.

C. H. Wheeler has been designing and building condensers since 1903; has developed such features as Dual Bank Design and Reverse Flow.

C. H. WHEELER MFG. CO.

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Whenever you see the name C. H. Wheeler on a product, you know it's a quality product

Steam Condensers • Steam Jet Vacuum Equipment • Centrifugal, Axial and Mixed Flow Pumps • Marine Auxiliary Machinery • Nuclear Products

Trend Of Affairs

Some Great Problems And Great Advances

IN THE eleventh month of the year now gone, Kresge Auditorium was filled time after time with young men and women pondering the origin of the universe, our galaxy, our sun, our earth, and living things. They heard of achievements with new instruments and new techniques, saw findings in one field applied to other fields, and learned of new discoveries and new theories pertinent to ancient questions.

On campus to give six Karl Taylor Compton lectures was Otto Struve, Director of the National Radio Astronomy Observatory. Here also, to deliver the Arthur Dehon Little lecture, was George W. Beadle, Chairman of the Division of Biology at the California Institute of Technology. And participating in seminars sandwiched between these lectures were other distinguished visitors.

Dr. Struve's opening address, which drew an overflow crowd, is summarized in the article on page 28.

The Molecules in Meteorites

IN ONE of the seminars which followed Dr. Struve's discussion of the bearing of knowledge of the stars in general on speculation about the dwarf we call the sun, a discovery was announced that will influence future thinking of both astronomers and biologists.

Melvin Calvin, Professor of Chemistry at the University of California, told how he had examined part of a meteorite that fell in Murray County, Kentucky, in 1950 – and found evidence of molecules that may have been ancestral, in the chain of chemical evolution, to the complex organic molecules that gave rise to life on earth. He told, too, of his plans to examine more meteorites, and suggested that journeys into space may add to knowledge of the sequence of events by which simple materials become living things.

While considering notions about ways in which the complex molecules that the biologists are studying now might have evolved from simpler molecules, it occurred to Dr. Calvin that chemical evolution might not have gone as far on other planets as on earth. Here, the pre-biological forms might have been used up and no longer available for study; but somewhere else, he thought, they might still be found and samples brought to earth by space vehicles.

Dr. Calvin joined the American Rocket Society only recently, however, and did not pin his hopes wholly on its members' ambitions. Meteorites, he recalled, are provided by nature. Although their exteriors melt and evaporate when they enter the earth's atmosphere the interiors remain cool and the molecules there are unchanged. So he arranged to get a 40-gram sample of one, and examined it with the sensitive and powerful analytical tools that have become available since the first studies of meteorites, more than half a century ago, showed that they sometimes contained hydrocarbon compounds.

In this sample, he found "very reasonable evidence of the presence of molecules of the aromatic heterocyclic type resembling the pyrimidines and purines present in terrestrial genetic material." The existence of these fossil chemicals in meteorites, he added, suggests that such molecules have been formed by non-biological processes outside the earth.

Pyrimidines and purines are fragments of nucleotides, chemicals which are in turn fragments of chromosomes – and chromosomes are the materials that permit the continuation of life and the inheritance of genetic characteristics.

Will Our Noise Deafen Us?

THESE REMARKS by Professor Calvin prompted Dr. Struve to discuss the possibilities of life outside the solar system – and to recall studies of S. S. Huang and others of the "habitable zones" around stars, within which a planet might support life. Around cool stars, these zones are so small that a planet like ours is not likely to be found in them. Around very hot stars, the zones are large but the stars themselves change so rapidly that there would not be time enough for life to evolve. The place to look for it, he suggested, is on planets of stars with an intermediate surface temperature similar to that of the sun.

Within about 20 light-years of us there are 42 stars, but only two besides the sun are the kind where planets supporting life are likely to be found, and it is improbable that creatures like ourselves inhabit them right now. But Dr. Struve regards it as certain that such forms of life do exist now somewhere in the tremendous reaches of our Milky Way galaxy.

"The radio astronomer," he said, "cannot assume that all of the signals he receives are from physical sources, although the probability of recording signals

from intelligent inhabitants of other worlds is exceedingly low."

To illustrate the difficulties, Dr. Struve asked his audience to imagine that nearly everyone in the auditorium was applauding. If one more person then began to clap, he said, the increase in noise would be comparable to that which the radio astronomer tries to measure with respect to background noise coming from the sky and various man-made sources.

The noise we are making, with radio and television stations, and satellites, and a host of other devices, may become so great, he concluded, that it will in time be detected by intelligent beings on other planets but we will be unable to receive signals from them because of our own noise.

From Hydrogen to Man

ATTENTION was focused on genetics again by Dr. Beadle in his Arthur Dehon Little lecture. The recent test-tube synthesis of DNA (deoxyribonucleic acid) by Professor Arthur Kornberg and his associates, said Dr. Beadle, suggests how such molecules might have evolved through a series of spontaneous chemical reactions to initiate organic evolution here on earth.

"It is now possible to conceive," he went on, "how elements, inorganic molecules, organic molecules, primitive virus-like living systems, cellular organisms, and finally man, might have evolved step-wise from a primitive universe of hydrogen — with no single step more difficult to understand than the atomic nuclear reactions, chemical processes, and genetic mutations we observe and investigate experimentally today."

Dr. Beadle's subject was "The Place of Genetics in Modern Biology," and an abstract of the lecture which he prepared for those unable to attend follows:

Because it deals with the nature of basic molecules unique to all living things, genetics serves as an important unifying principle in modern biology. Each of us develops from a tiny, almost microscopic, bit of protoplasm, the fertilized egg cell. Within this are carried the specifications for all subsequent development and function. To carry out successfully these directions — these recipes for men — time, a proper environment, and several tons of raw materials in the form of food are required.

Genetics asks five questions about the directions, which consist in large part of the genetic material or information contributed to the egg by the parents:

1) How are they transmitted from one generation to the next? This is the classical genetics of Mendel and of today's general biology.

2) In what language are the directions written? In the case of man there is packed away in a single microscopic cell nucleus — that of the fertilized egg — information sufficient to fill several hundred large library volumes if translated into printed English.

3) How are the directions replicated or "reprinted," as they must be, with each of the many cell divisions that intervene between one generation and the next? The mistakes are few.

4) By what mechanisms are genetic specifications "translated" during the many processes that make up the development and proper functioning of a complex organism like man?

5) What happens to the occasional mistakes or "typographical errors" that are made during the process of replication of the genetic directions? Unfavorable ones must somehow be discarded, for otherwise they will be cumulative with time. Natural selection is one way by which they are eliminated. The less frequent favorable mistakes are the raw materials of evolution and they are selectively multiplied by natural selection.

The search for answers to these questions, especially the last four, has been aided enormously by the identification of genetic material with the chemical substance DNA, and more especially by the working of the three-dimensional structure of DNA molecules by Francis H. C. Crick and James D. Watson in 1953.

DNA is unique among known molecules, for its structure suggests how it might carry genetic specifications, replicate, direct the synthesis of other key molecules, and undergo occasional mutation.

DNA molecules are giant double complementary polymers, built of four kinds of units. Each molecule may be thousands of units long. A four-unit segment can be represented symbolically as follows:

$$-1-2-3-4-$$
$$-2-1-4-3-$$

The order of units in one chain is the complement of that in its partner; unit 1 is paired with 2, and 3 is paired with 4.

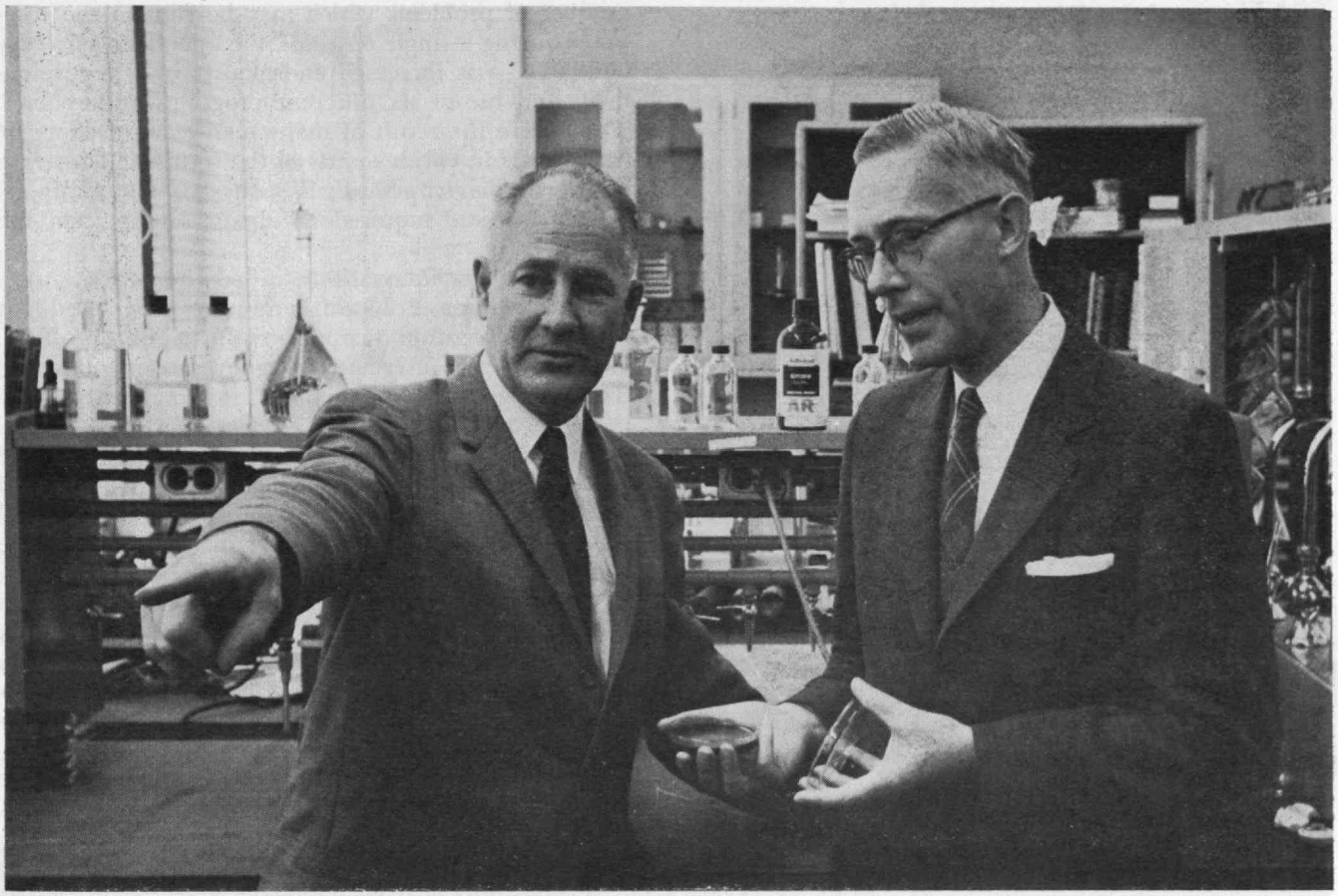
The sequence of units — they can be ordered in any of a large number of ways — constitutes a kind of molecular code written in four symbols. The directions for development of a human being are encoded in molecules totaling several hundred million such units.

Replication is believed to occur by separation of paired DNA chains, each chain then serving as a kind of molecular template against which new chains are constructed from building blocks of the four kinds.

In development, information coded in DNA is somehow translated into other specific molecules. Among the most important of these are the proteins, giant linear polymers built up of hundreds of amino-acid units, of which 20 kinds occur in proteins. The proteins serve essential functions in all living things from viruses to man. In viruses, they serve in part as protective coats around DNA (or RNA, another nucleic acid that occurs in some viruses). In higher forms, such as man, they serve as structural materials, as hormones, as parts of transport systems (hemoglobin), and as enzymes that speed up vital reactions.

Gene mutation consists in errors in replication — mistakes in reprinting the code during cell division. Most such errors are deleterious but some are favorable and provide the raw materials of evolution. Much has been learned about the detailed nature of mutation in terms of DNA structure. . . .

Man is unique among all known living things in the high degree of development of his nervous system. This permits memory, communication, and reasoning which, in turn, make possible the evolution of cultures in which knowledge of art, music, religion, technology, and science are transmitted from one generation to another by devices that far transcend the blind mechanical biological inheritance of man's pre-human evolutionary ancestors.



George W. Beadle (left) with Irwin W. Sizer, Head of the Department of Biology, in one of the Institute's laboratories.

What Becomes of Starlight?

IF WORLD WAR I was won by chemists, and World War II by physicists, Dr. Struve said in his final lecture, the cold war certainly is being waged by astronomers – and we suffered a humiliating defeat in 1957. The first Sputnik made that year as memorable in astronomical history as 1492 is in the history of geographical exploration.

Portugal, Dr. Struve recalled, once led the world in astronomy and navigation, but permitted Spain to finance the voyages of Columbus "and from that small investment sprang Spain's great colonial empire which assured Spain's pre-eminence in the Western world until fairly recent times. In 1957, it was America that lacked vision, and the Soviet Union that had it – but Portugal's fate need not befall us if our scientists now "think hard and work even harder."

Astronomy, he emphasized, is part of physics and has two purposes:

¶ To test the operations of known laws of nature under conditions that cannot be realized in the laboratory; and

¶ To discover laws of nature which would otherwise remain unknown because of the long intervals of time (billions of years) and the great distances (billions of light-years) that are required to study them.

As examples of its value, Dr. Struve cited observations needed to study gravitation, the tests of Einstein's theory, and the beginning of nuclear research. Then he asked:

"What happens to all of the radiation that is poured into the universe by the stars?

"The sun alone pours into space 4 x 10^{33} ergs per second, the 2 x 10^{11} stars in our galaxy produce about 10^{45} ergs per second, and all galaxies about 10^{56} ergs per second. All of this vast amount of radiation pours into space at the rate of the velocity of light, in all directions, and is forever lost from the observable part of the universe."

New laws of nature might be found, Dr. Struve is confident, by striving to answer such questions as this.

Astronomers have been extraordinarily conservative, he continued. Ten years ago, when 50 of the profession's leaders were asked to predict developments that might reasonably be expected soon, not one mentioned the possibility of building a telescope for a space vehicle. But they have the advantage of working "in one of the few almost unexplored fields of physics."

The problems are countless, Dr. Struve declared, "and unexpected discoveries outnumber those that have been predicted." But the world has only about 2,000 astronomers, and the United States possibly only 500. So he concluded the Compton lecture series by expressing three hopes:

1) That America will not let the Russians get ahead of us in radio astronomy as they have in space science;

2) That some of his many auditors might have been inspired to become professional astronomers; and

3) That M.I.T. will recognize astronomy as part of physics within the structure of its Physics Department.

654 Users of the 704

ONE of the many significant changes at M.I.T. in the 1950's was the establishment of the Computation Center in the new Karl T. Compton Laboratories. The Center's principal objective has been to increase the number of persons qualified to use the IBM 704 computer and associated equipment, and thus to further their research efforts. In a review of its growth, prepared for a national conference of the Association for Computing Machinery last fall, Frank M. Verzuh, '46, reported that 654 programmers were using the Center's 704, and had attained some proficiency in its use. Many more are enrolled in academic courses at M.I.T. and the 30 other New England colleges and universities which keep the computer busy.

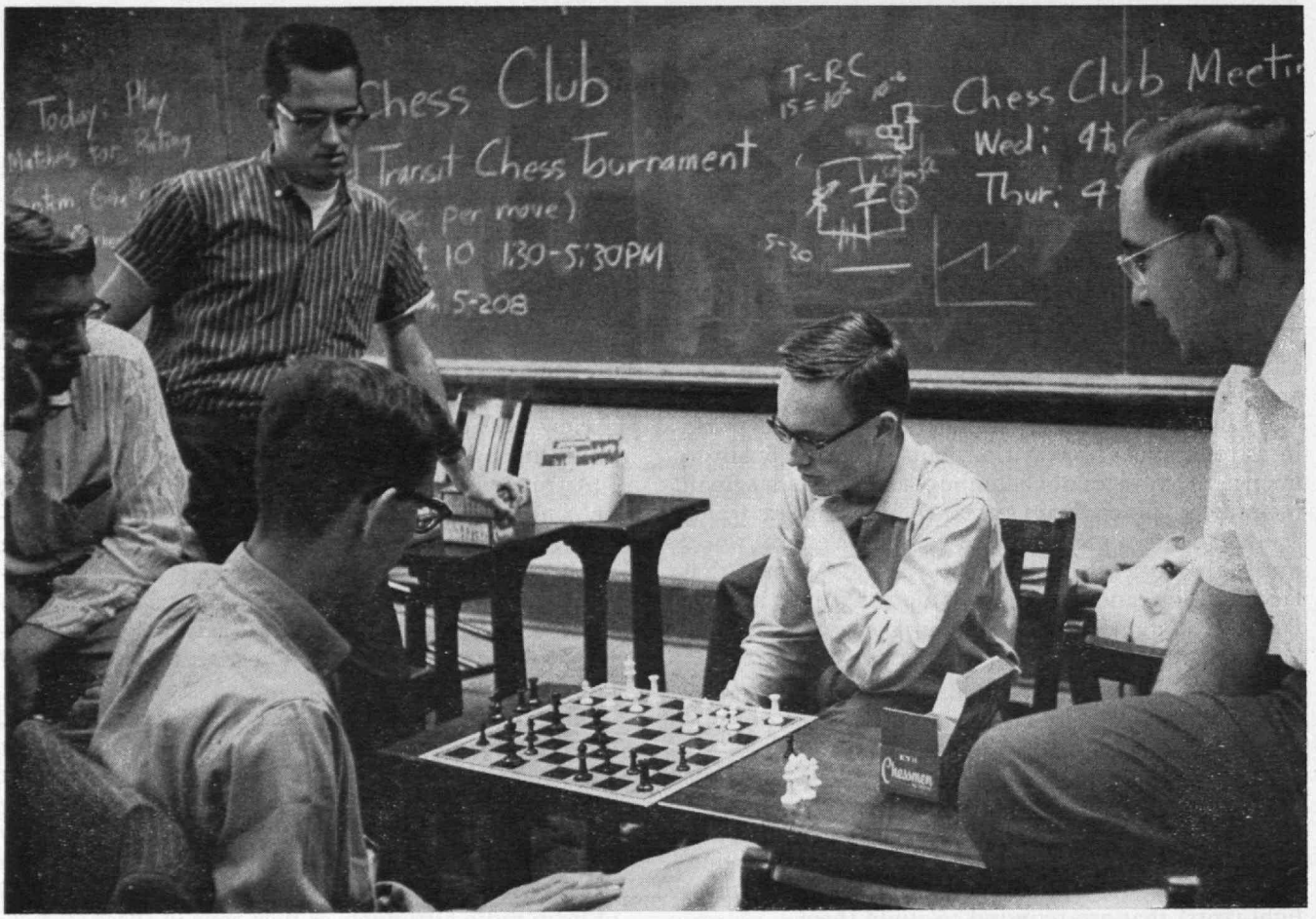
The Center occupies the whole first floor and part of the basement and second floors of the Compton building. The 704 is operated normally on a two-shift basis, but at times the load has been so heavy that three shifts plus Saturday operations have been required. As the number of programmers has increased, it has been necessary to establish a rather tight set of controls but, generally speaking, the work is processed on a "first-come-first-served" basis.

"It soon became apparent," Dr. Verzuh said, "that a special effort ought to be made to increase the number of problems which may be run on the computer during a single day, and the operating efficiency of the 704 was increased enormously by the development and use of six different programs and systems. These were the result of many man-years of effort by individuals in various parts of the country. The availability of these operating systems has materially reduced the time required to obtain results from the computer."

One of these innovations, called the M.I.T. Automatic Operator Program, minimizes the need for human intervention during the solution of a problem, and enables the user to obtain several sets of results from a single run.

Another is called the M.I.T. Post Mortem Routine. It provides a means for examining the contents of the core memory at any time during the solution of a program. This is helpful when a program has "died on the machine," because examination of the core memory often sheds light on "the cause of death."

The Center has had many visitors — including, last month, some of the attendees at an Eastern Joint Computer Conference and Exhibition sponsored by the Association for Computing Machinery, the American Institute of Electrical Engineers, and the Institute of Radio Engineers. Details of the Center's operations are available in its semiannual reports.



THE CHESS CLUB at M.I.T. has 25 members this year, and a mailing list of more than 100 players. Lawrence F. Wagner, Jr., '60, facing camera, is its president and current Institute champion. His opponent when the photo was taken was Andrew Browder, G. At left are Carl B. Dover, '63, and Kenneth T. Whiton, '63; the observer at right is George D. Ryerson, G. Rapid-transit tournaments, in which moves have to be made within 15 seconds, are often held.

A Cheating Computer Is a Pain in the Neck

DAVID ECKLEIN is a freshman at M.I.T. this year who is pretty sure his field is electronics. Last year as a 16-year-old high school senior, he won second prize in the National Science Fair finals at Hartford, Conn., by exhibiting a checker-playing digital computer 15 feet high and weighing 1,200 pounds.

From Hartford, the computer went to the IBM Laboratories in Poughkeepsie, N.Y. where David worked with Arthur L. Samuel, '25, on his checker-playing program for the IBM 704 computer. Like Mary's little lamb, the computer followed David to school when he entered M.I.T. — after it had won awards from the Armed Forces, the Iowa Acadamy of Science Talent Search, Future Scientists of America, and the Iowa Junior Acadamy of Science, and a medallion from Bausch & Lomb.

This EMAG III (game spelled backwards) was third in a family of computers which Ecklein constructed while in Cedar Falls High School in Iowa. His freshman year there he made a small relay computer that played tick-tack-toe, and the next year a computer that reasoned in Aristotelian syllogisms. Even though he took each one apart to make the next, computer components were pretty expensive, so David then looked for extra funds.

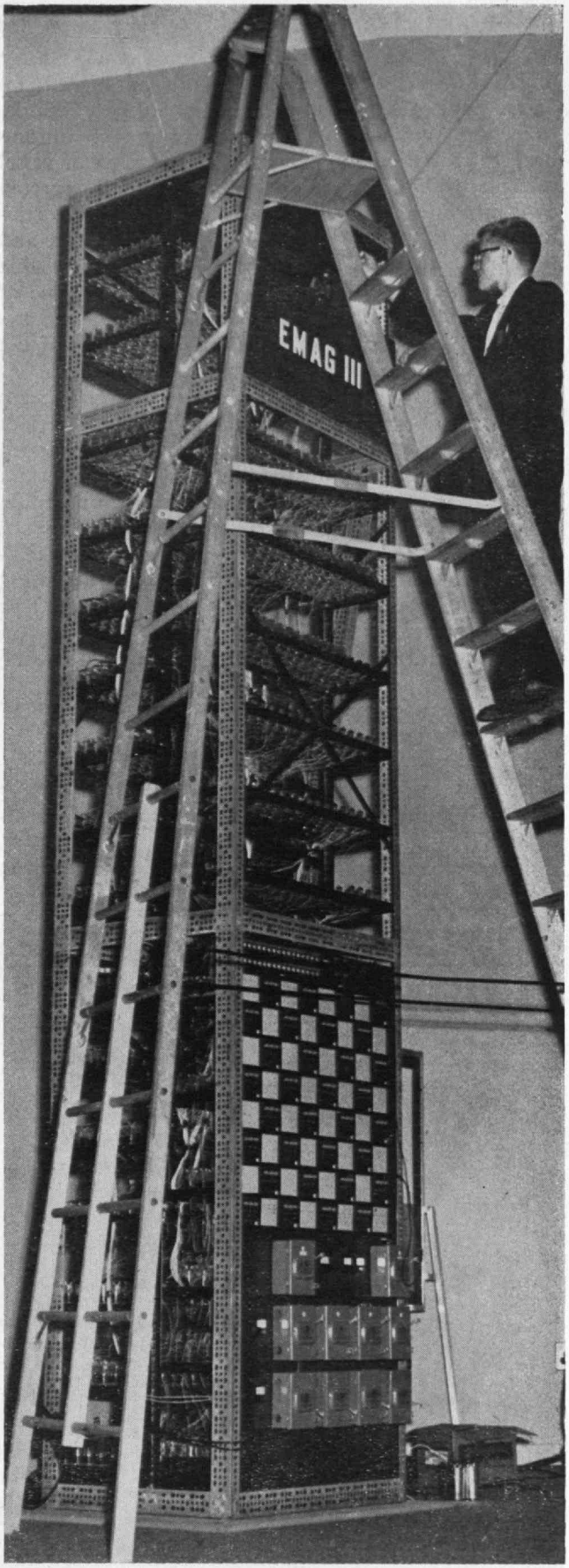
A letter he wrote to the National Joint Computer Committee (part of the President's Committee on Scientists and Engineers) was read by Chairman Claire Farr of Lincoln Laboratory and referred to IBM. After being interviewed by a local representative, David was flown to New York and hired for the summer. With money from this job, plus savings from paper routes and selling Bibles, he began work on EMAG III (which displaced the family car in his father's brand-new garage).

"My next problem," says David, "was getting parts for a crazy monster like this." Eventually, he rounded up 3,200 tubes, more than 3,000 sockets, 200 germanium diodes, thousands of resistors and pinball machine relays, 16 electric-blanket controls, and miles of wire. Section after section was sandwiched between strips of metal office-shelving. Once he made a wrong connection and blew out 90 tubes; it took a whole weekend to install new ones. But the job finally was done — and the computer played checkers.

It was carted from Iowa to Hartford in a truck lined with mattresses and, after the Science Fair, IBM hauled it to Poughkeepsie, where David was spending his second summer. There he gave noontime lectures on its construction. But toward the end of the summer it began moving pieces which weren't there and misbehaving in other ways. Before he could fix it, David was due at M.I.T.

Here he ran into a housing problem. So an Institute professor suggested that he put his computer in the Museum of Science, where David has spent several weekends trying to cure his electronic offspring of its tendencies to cheat. For its creator, however, EMAG III had ceased to be fun.

"When it got to the patching stage," he explains, "it was sort of a pain in the neck."



Institute students often have brought cars, trains, telephones, hi-fi sets, and innumerable other things to school with them, but — so far as is known — David S. Ecklein, '63, is the first to have brought along a giant like this to play checkers for him.

For Woods Hole's Fleet

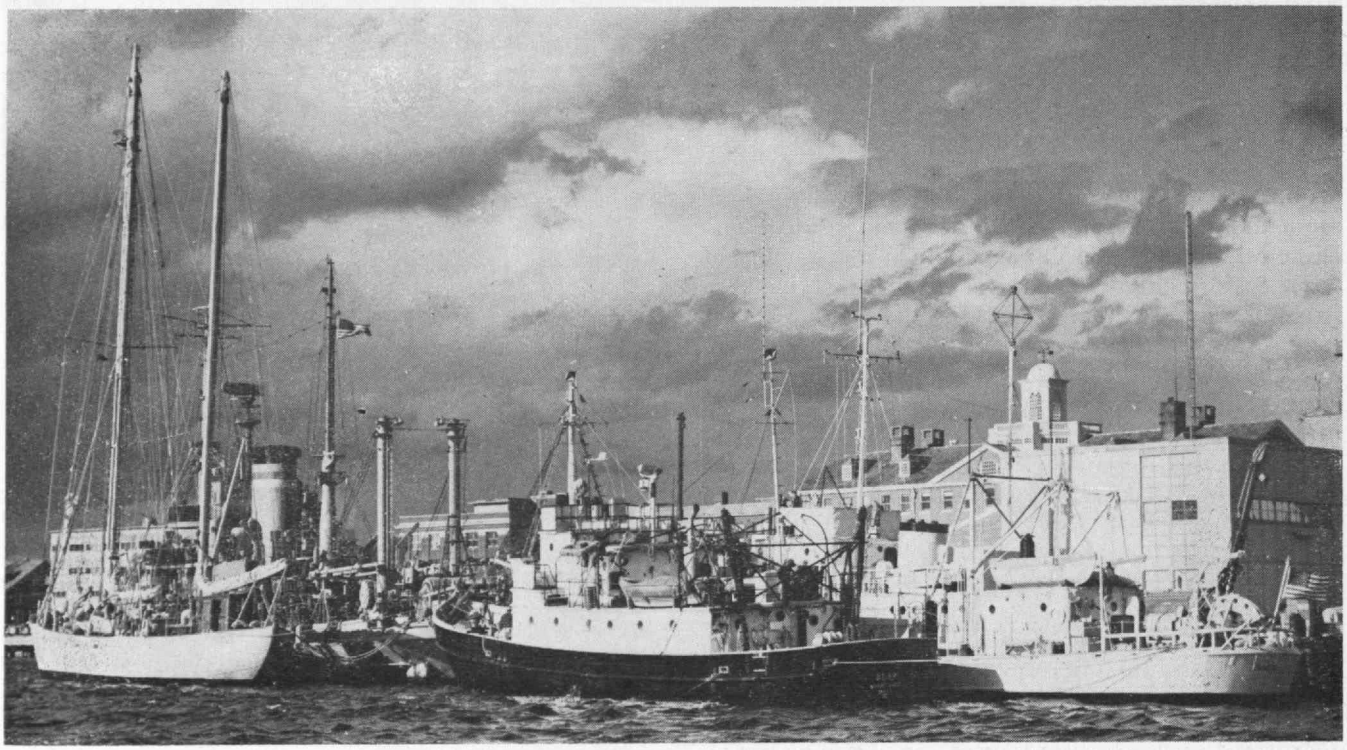
THANKS to a $3,000,000 grant announced on Thanksgiving eve by the National Science Foundation, the Woods Hole Oceanographic Institution's fleet (pictured below) is to have a new kind of vessel to replace its "flagship" *Atlantis*. This one is expected to combine the best features of optimum seaworthiness and performance found in the "fat" trawler and the "lean" Coast Guard cutter types. It will be able to operate in weather too adverse for all but one of the Institution's present vessels and should be, says Paul M. Fye, Director of the Institution, "one of the most efficient and versatile vessels afloat."

She will have an over-all length of 175 feet, beam of 36 feet, and loaded displacement of 1040 tons. Her operating range will be 7500 miles at a cruising speed of 12 knots. Her complement will be 19 scientists and a crew of 18 officers and men. Roll and pitch damping devices, wide speed control, high maneuverability, superior laboratory spaces, and excellent working facilities will be built in. Additional features still being studied include antirolling tanks, acoustical quietness for underwater sound studies, a gravity laboratory, an aquarium, and freezers for preserving biological specimens and bottom sediment cores.

"U.S. oceanographers badly need adequate vessels," Alan T. Waterman, Director of the Foundation, said, "and this grant is a first step. Construction of a replacement for the *Atlantis* received the unanimous approval of directors of all U.S. oceanographic institutions."

An article in The Review next month will describe the work of an M.I.T. student at Woods Hole.

EACH YEAR the directors of the Midtown Galleries in New York invite six of America's foremost designers to create interiors that effectively illustrate the use of contemporary American art. This is a photograph of the interior done for this exhibit last fall by Steinhardt & Thompson, Architects (Rolland D. Thompson, '49).



Woods Hole Oceanographic Institution facilities in addition to those of M.I.T. will be used by researchers in oceanography and meteorology who receive fellowships made possible by a recent $150,000 grant from the Ford Foundation. M.I.T. will award these fellowships for graduate work to students with outstanding qualifications in the physical sciences and mathematics. Pictured here (from left to right) are Woods Hole vessels: *The Atlantis, Chain, Bear,* and *Crawford.*

(THE TREND OF AFFAIRS *is continued on page 38.*)

The Revolution in Surveying

Increases in our ability to measure, compute, and plot are enabling engineers to solve new kinds of problems

BY CHARLES L. MILLER

THE numerous new fields of technology which have emerged during the last several decades are providing a host of exciting new frontiers, and many of the older fields now are considered obsolete, or at best old-fashioned. Many of the methods and techniques of problem-solving associated with the older fields are indeed quite obsolete. But the problems themselves, as a reflection of basic needs and desires of mankind, are not all obsolete. Some of the most exciting challenges on the technological scene are those associated with possibilities of effecting a *revolution* in a classical field which has developed by *evolution*. The application of *integrated* new technology to some of the oldest needs and desires of mankind has challenging potentialities.

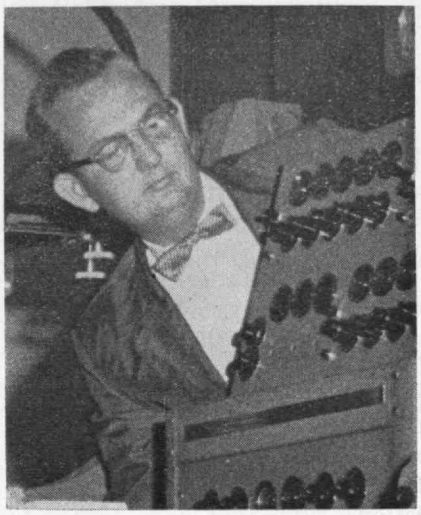
Astronomy is an example of a classical field which is undergoing a revolution as a result of the impact of modern technology; space technology is providing a host of new engineering frontiers.

Surveying is another example of a classical field of technology which has evolved over many centuries. Although the revolution here has not been spectacular in terms of impact on the public and the technological community, surveying has been undergoing some rather dramatic changes. Even a brief description of some of these changes may modify the long-standing image of surveying as the simple use of the transit, tape, and range pole.

The revolution in surveying has resulted from two basic changes in approach:

¶ At the data acquisition or measurement stage, indirect methods of measurement are replacing the classical direct methods.

¶ At the data reduction and processing stages, automation, or the replacement of men by machines, is being applied extensively.



Charles L. Miller, '51, Associate Professor of Surveying, in the Department of Civil and Sanitary Engineering, is a leading investigator of the "data engineering" frontier surveyed in this article.

Electronic Instruments

Since the time of the Egyptians, the methods and techniques of surveying have been based on direct measurement of distances and angles. By direct measurements, some form of laying yardsticks end-to-end and intercepting the physical variable on graduated scales is meant. The transit and tape are merely refined versions of the protractor and rope used by the Egyptians. The inefficiency and inconvenience of the direct approach in most fields of technology has led to the development of indirect or analog approaches to measurement. Most of these developments have been based on the efficiency and convenience of electronic instrumentation.

As a result of tremendous research programs during and since World War II on electronic systems for navigation and target location, many types of indirect measurement systems for spatial location, such as radar, have been developed. It has been possible to apply modified versions of some of these systems to a limited class of nonmilitary surveying problems. Shoran, Raydist, and the airborne profile recorder are examples. The most important development in electronic surveying instruments in terms of practical value, however, is represented by two new types of electronic distance-measuring instruments. One uses modulated light waves and the other microwaves to measure distances of less than one to more than 30 miles with accuracies of better than one part in 100,000 in a matter of minutes. Such instruments make taping for control surveys quite obsolete in practically all situations. The classical triangulation survey with emphasis on angulation is being largely replaced by trilateration surveys which take full advantage of the modern ease of measuring distances. Surveys which formerly required many months can be achieved now in a matter of days. Electronic distance measurement calls for many fundamental changes in the approach to field control surveys.

Mapping from Photos

The second form of indirect measurement which has radically changed surveying is concerned with that phase having to do with mapping. The classical and direct measurement approach to mapping made use of the plane table, transit, level, tape, and rod to measure distances and elevations required for plotting the map. Such an approach has been largely replaced by the science of photogrammetry.

It is based on geometrical properties of the photograph which permit the construction of a precise scale model of objects. The measurement of a scale model of the terrain in the convenience of the laboratory is far superior to attempts to measure the terrain directly in the field. For mapping purposes, aerial photographs are utilized in conjunction with a precision optical-mechancial analog computer termed a stereoplotter.

Classical surveying makes extensive use of manual skills for operating devices, recording data, reducing data, performing computations, and plotting data. Automation holds a tremendous potential for the substitution of machines for men. Many of the activities can be performed effectively by machines but the photogrammetric instruments and devices used for reducing the photographic data to a usable form, even though far more efficient than field survey methods, require skilled human operators.

There is considerable activity under way aimed at replacing the human element in the photogrammetric system so that a truly automatic mapping system will be available. Most attempts in this direction are directed toward development of some form of electronic correlation of images to replace the function of the operator's stereovision. In place of a purely analog system, some systems now in the hardware stage make use of a real-time, high-speed digital computer to perform certain of the feedback and data-reduction steps.

The tellurometer, an electronic distance measuring instrument, utilizes microwaves. It is now widely used.

Historically, surveying always has been associated closely with applied mathematics. Indeed, surveying seems to have given birth to geometry (the word means "earth measurement"), and the computational problems confronted in surveying and astronomy have been responsible for many developments in numerical mathematics. It is not surprising, therefore, that the advent of the digital computer has profoundly influenced modern surveying. The machine has both largely taken over the computational work in surveying and made many of the classical manual computational approaches and techniques obsolete. This is particularly true of complex geodetic computations where evolution has produced an elaborate system of manuals, tables, and formulae to facilitate hand calculations.

Automatic Plotting

A third phase of surveying where automation will play an increasingly prominent role is the plotting or presentation of data. One normally associates large numbers of draftsmen with surveying. A large percentage of the drafting now performed by men can be handled effectively by machines. The first generation of automatic plotters for preparing maps and drawings is now in use. Such plotters normally operate with punch cards or punch-tape output from digital computers; finished working blueprints are being produced by these instruments. Automatic plotting is not nearly as advanced as the application of automatic data-collection instruments and digital computers, but rapid progress in the next few years is expected.

From this brief review of some of the significant advances in surveying, it is obvious that an enormous increase in our capability and capacity to measure, compute, and plot has been experienced. Although such developments permit each step or phase of the established problem to be solved with several orders of magnitude of increased efficiency, the real challenge is presented in the recognition that the new technology represents *a new kind of problem-solving ability which allows us to formulate and handle new kinds of problems.* One is presented with the possibility of developing entirely new approaches to the most basically stated problems. The professional and educational activity in surveying at M.I.T. is oriented in this direction.

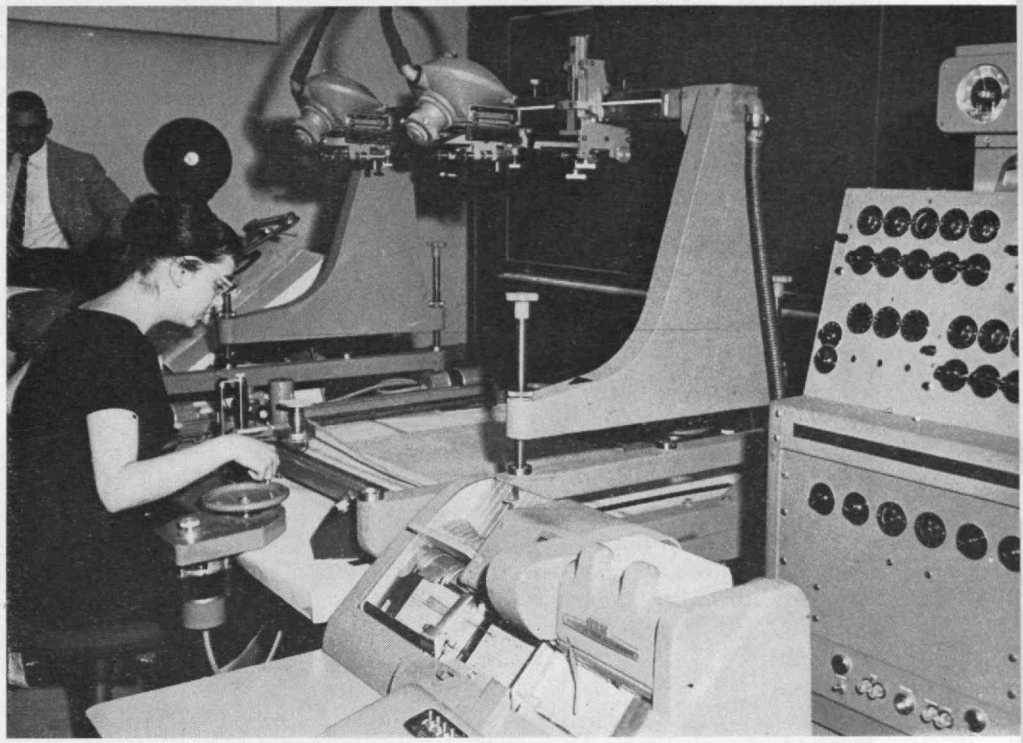
Highway Problems

As an example, consider the problem of highway location and design. Photogrammetry for mapping, digital computers for calculating, and automatic plotters for drafting can contribute significantly to the efficiency of the steps involved in classical highway engineering practice. But a more basic problem is the determination of the "best" location and the design and the communication of this solution to the constructor. Major progress has been made at the Institute in developing an integrated system of photogrammetry, automatic instrumentation, digital computers, and numerical techniques for new approaches to civil engineering problems such as the stated highway problem.

The Digital Terrain Model System, developed at the Institute under the sponsorship of the Massachusetts Department of Public Works and the U.S. Bureau of Public Roads, is serving as a prototype to establish operational procedures. A digital or numerical equivalent of a contour map is obtained by scanning either a photogrammetric map or the stereo-model directly with automatic recording instrumentation developed at the Institute. The digital representation of the terrain is read into a digital computer along with a set of design criteria data and a limited number of control-point co-ordinates to specify the alignment to be evaluated, and the computer is provided with sufficient instructions to establish the complete geometric solution.

The output of the computer, at the present stage of development, is sufficient to plot automatically a preliminary set of construction plans for the highway. Whereas classical highway engineering practice, even with the new technology, limits the evaluation procedure to several alternate solutions, the new system makes it technically and economically feasible to evaluate numerically dozens of alternate solutions and thus converge on the optimum solution.

Although the work completed to date represents only a crude beginning, the operational version of the prototype system already is finding extensive practical application. About 30 public and private highway engineering organizations have applied for the computer program material. Michael Baker, Jr., a member of the Civil Engineering Visiting Committee, recently reported that his firm had applied the system to more than 600 miles of alignment in a five-month period. On one project, a saving of over $2,000,000 has been reported as a result of applying the system to a more thorough analysis of a location problem.



With a photogrammetric stereoplotter, this young lady obtains numerical terrain data from aerial photos for Professor Miller and his associates.

Additional Factors

Obtaining the optimum geometric solution in relationship to the terrain does not necessarily mean that the "best" solution has been achieved. Many other factors, such as the cost of right-of-way and the cost of vehicle operation, influence the final decision. So, within the basic geometric solution framework, a system for acquiring, processing, and evaluating land-use data is being explored. Air-photo interpretation will be the important data-acquisition tool for both land-use and soil-type information.

To attack the problem of vehicle operation cost, a computer program is being developed which will simulate the operating performance of a vehicle over the proposed alignment and profile. With the inclusion of this program in the system, the computer will be able to "drive" different types of vehicles over the facility and determine the user costs for each solution as well as the construction and right-of-way costs.

Since the best solution with respect to each of the separate location factors results in different locations, the determination of the best over-all solution is a problem in resolving "conflicts of interest." This is the class of problems to which the methods, techniques, and tools of "Operations Research" are directed. A scientific attack on the basic problem of highway location, therefore, involves an integrated consideration and application of an extremely large number of technical specialties, both old and new. Although the new approaches are being developed in terms of highway location, the basic concepts and many of the techniques are applicable to a wide range of civil engineering projects.

Data Engineering

Since surveying is identified rather firmly as a field of technical specialization, the attempts to develop new problem-solving approaches, which are an outgrowth of surveying but which go far afield of the dictionary and professional-society definitions of surveying, are called "data engineering" in the Department of Civil Engineering. The new approaches are basically concerned with the ability to acquire and process massive amounts of data. Data engineering is concerned with the acquisition, reduction, transmission, conversion, storage, processing, analysis, and presentation of data as required to furnish information for decision-making in the planning, location, design, construction, and operation of engineering projects. This field already exists, but it is scattered throughout the new fields of technology and cuts across many of the classical divisions of engineering.

Within the Department of Civil Engineering, no particular effort will be made to improve the state of the art in the many subdivisions of data engineering. Such efforts will be left to the many fields of technical specialization largely outside the bounds of civil engineering. But, by formulating and developing integrated systems of the best capabilities that modern technology can offer, it is hoped that a useful contribution can be made.

Although the professional objectives of achieving new approaches to civil engineering problems are quite important, the formulation and implementation of a corresponding set of educational objectives is even more challenging. This is a frontier in itself, a discussion of which must be deferred until another occasion.

Talk of Our Times

Urgent National Goals in Education

SINCE returning to Cambridge from Washington, the M.I.T. Corporation's Chairman, James R. Killian, Jr., '26, has spoken repeatedly of the necessity of giving our young people the best education that we can provide. In an address at Milton Academy in November, he explained the situation as follows:

THE need to strengthen our education is made urgent by the unprecedentedly difficult position this nation finds itself in today and the new and greater responsibilities which consequently fall upon its citizens. The conditions which bring about this sobering situation are clear. They are:

First, the cleavage and conflict between the Free World and the Communist World, with the communists proclaiming their intent to achieve superiority over the free nations.

Second, the grim problems of national security with both the U.S. and the U.S.S.R. possessing nuclear weapons and a developing capability to deliver them by intercontinental ballistic missiles. We must have the strength and taut alertness to deter war, particularly war involving the massive use of nuclear weapons.

Third, the responsibilities for leadership of the Free World and the maintenance of an acceptable peace which rest in the United States.

Fourth, the extraordinarily rapid changes, and the increasing rate of change, which characterize the world today. The scientific revolution and rapidly advancing technology are bringing changes all over the world, not only in the way men live and in their increasing control of nature, but in their expectations and ambitions. We are in the midst of what has been called the "revolution of rising expectations," with peoples everywhere seeking ways to improve their standards of living, however low or high their standards may be. These conditions of change impose new requirements for adaptability and versatility on men everywhere, but especially on the citizens of this country, with its highly industrialized society and its world responsibilities.

These four conditions of the world today — the fact that it is a divided world, the requirement to have the strength to deter a total nuclear war, the responsibilities of leadership, and the requirements of change — put a great premium on trained intelligence and moral strength. They call for the best education of our young people that we can provide; anything less than the best will not be good enough.

This is why I feel that educators everywhere must feel a sense of urgency to advance our education and that our citizens must back them up with a comparable sense of urgency and determination.

* * *

There are four national goals in education which seem to me to command top priority today, all of them directed toward intellectual excellence. In a recent report of the President's Science Advisory Committee entitled "Education for the Age of Science," these goals were outlined as follows:

1) Every school and college should re-examine its curriculum to make sure that in every aspect it is giving adequate challenge to the intellectual capacities of its students.

2) We should do far more than we are now doing to enhance the prestige of the teacher, and to provide him with more effective support in his efforts to improve his teaching. This includes the development of better teaching aids and learning how to use motion pictures and television in their full potential to lengthen the strong arm of the exceptional teacher.

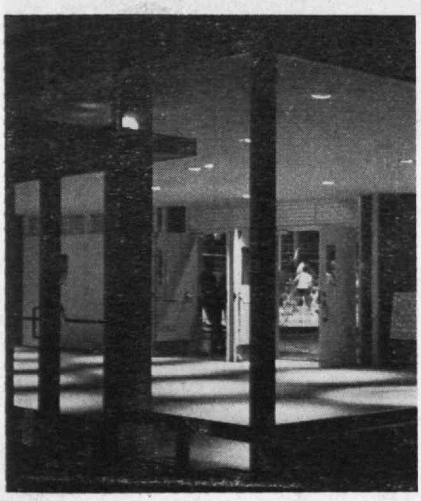
3) We should move much further in the direction of adapting our teaching to the widely varying competence of students, and seek especially to meet the needs of the most gifted students. We must seek to lift student performance to higher levels of excellence by greater motivation and by the provision of rewards for intellectual achievement. Public and private agencies should combine to offer on a national basis a much larger number of prizes than now exist to high and preparatory school students for unusual intellectual achievement in important subject matter fields.

I have just returned from a very challenging assignment in Washington which was concerned mainly with the strengthening of American science and technology. Almost every major problem I encountered seemed to have an educational aspect. We need more and better materials to do the job ahead in nuclear technology, in missile development, and in space vehicles. We are hampered in getting these materials by the shortage of men educated at an advanced level in materials science and engineering. We have great opportunities ahead in oceanography and meteorology, but we don't now have enough men educated in these fields to make the headway we should.

My experience led me to the further conviction that the general level of scientific literacy in the United States is not as high as it should be, if the American people are to deal wisely with all the great policy questions which arise out of advances in science and technology. Science has become an essential part of a broad, liberal education for living in an industrial society.

I concluded also that we need more scientists and engineers whose education and interests are sufficiently broad to permit them to take a greater part in shaping public policy and in evolving our social strategy. We need statesman-scientists and statesman-engineers

(Continued on page 48)

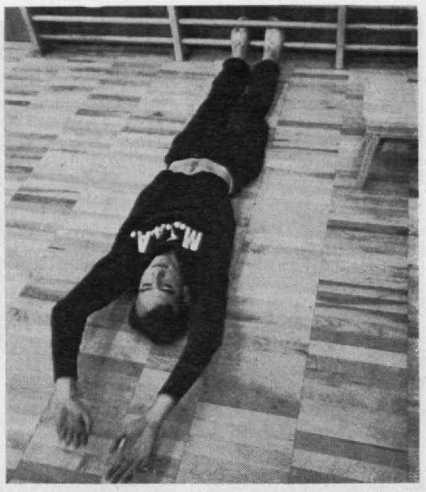


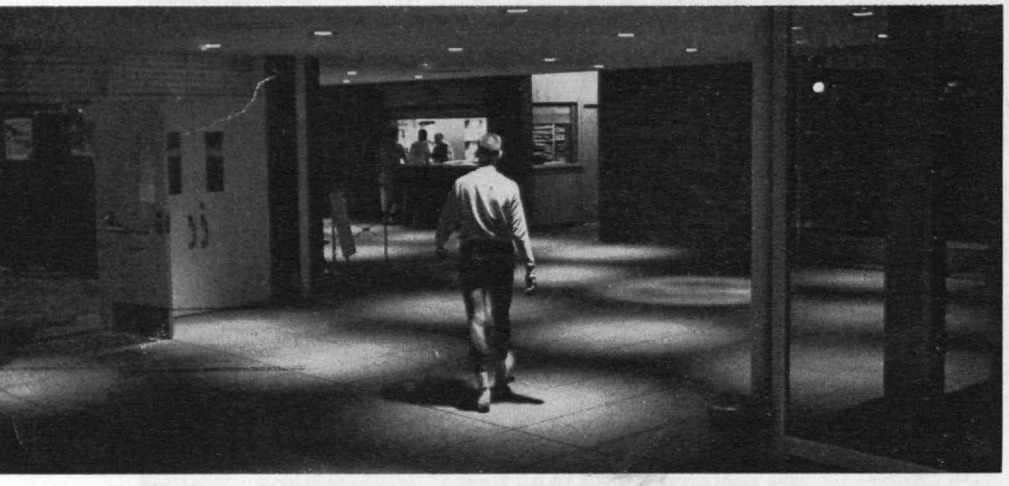
Business Booms at 5 p.m.

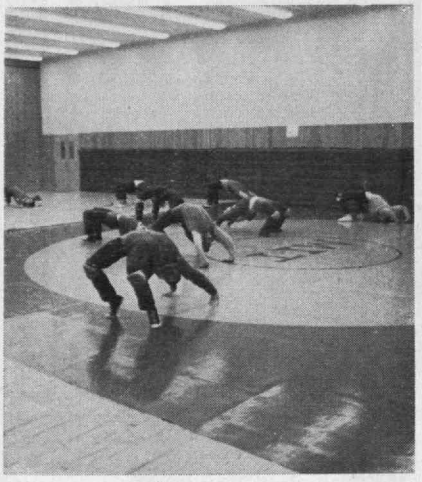
ACTIVITIES in the Institute's newest building, the Du Pont Athletic Center, reach a peak between 5 and 8 P.M. daily. Some of the goings-on there this winter are depicted on the next two pages.

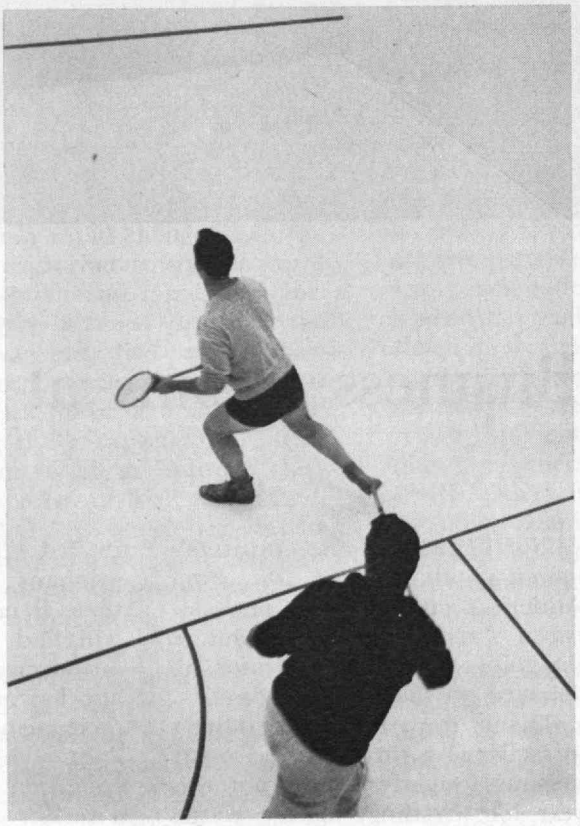
Thanks in part to this building's attractiveness, three time as many men as formerly turned out this year for wrestling; fencing classes totaled 128 when last counted; 30 gymnasts perform faithfully, and there is no telling how many you will find on the indoor track at any given moment. M.I.T. students also have taken up boxing and bicycle racing this winter.

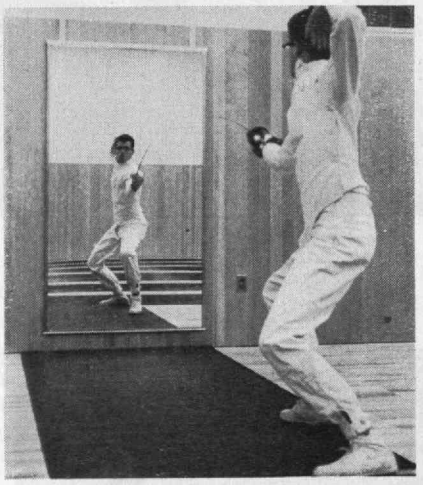
In addition, there are physical education classes for women twice a week.

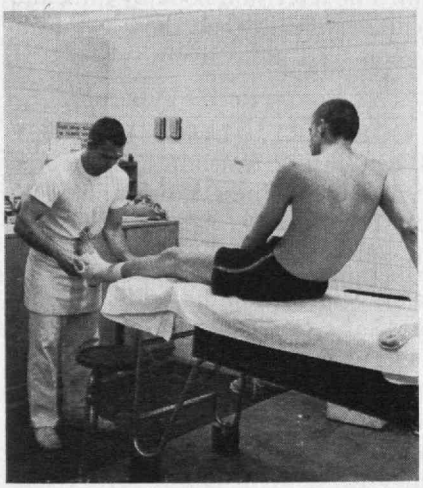


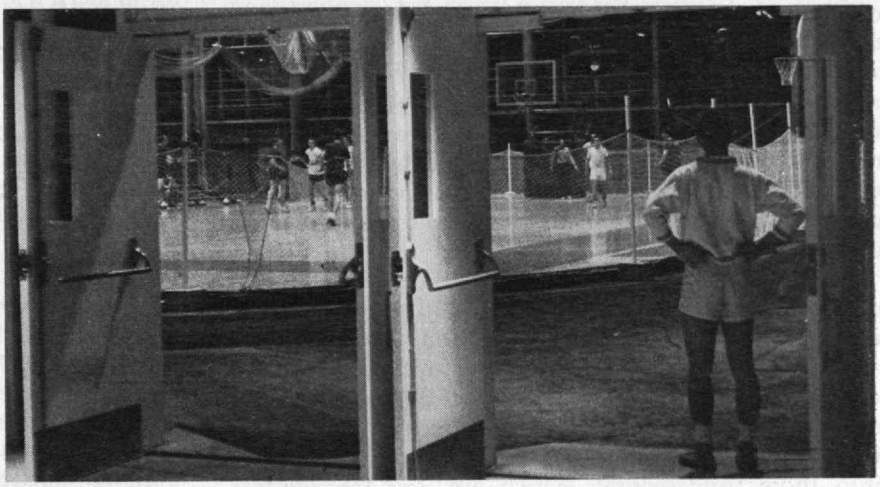












Books

THE PHYSICS OF TELEVISION, by Donald G. Fink and David A. Lutyens; Doubleday & Co., Inc. *Reviewed by B. Dudley, '35, of M.I.T. Lincoln Laboratory.*

THIS MONOGRAPH by Donald G. Fink, '33, and Mr. Lutyens is one of the volumes in the Science Study Series prepared under the auspices of Educational Services, Inc. This new, nonprofit educational corporation may be better known to readers of The Technology Review by its original name, the Physical Science Study Committee, whose formation, purpose, and early activities were recorded in The Review during 1957.* The primary purpose of volumes in the Science Study Series is "to provide a survey of physics within the grasp of the young student or layman."

Having been warned that these volumes are published as part of a fresh approach to the teaching and study of physics, we approached the reading of *The Physics of Television* with a certain degree of curious interest. Physics is physics, and the basic laws of science remain unchanged no matter how they are presented. But, as advance proofs of this volume were absorbed, it became evident that physics can be presented — at least for the layman — in a manner that is certainly as fascinating as many a novel.

As in reading any volume, it is necessary to understand its purpose to do justice to *The Physics of Television*. Those who skip the foreword and seek details of television circuitry, or who hope to acquire sufficient mastery of sync and blanking circuits to circumvent visits of a television technician when the receiver needs repairs are sure to be disappointed; this volume is not for them. But those who have a good comprehension of physics at the high school level and who desire an understanding of the basis on which television systems operate will find this an interesting, informative, and authoritative book.

It is no easy matter to develop the basic principles of television in a small volume of 160 pages divided into six chapters. It is difficult to find apt analogies, acceptable to the specialist, that will succinctly and accurately convey advanced concepts to the layman. It is even more difficult to keep the young reader interested in the main subject while making necessary excursions into those fundamentals which are, too frequently, regarded as dull and uninteresting. Yet this volume appears to have surmounted these difficulties quite successfully.

A tremendously wide range of subjects is dealt with, and Mr. Fink must have gone through a good deal of planning — and soul searching — to condense the results of his experience into this compact monograph. The chapter headings are: Communication, Light, Electricity, Light into Electricity and Back Again, From Studio to Living Room, and Color Television. For the impatient reader who is anxious to get on with the mechanics of television, the excursions into light, electricity and photoelectric phenomena in Chapters 2, 3, and 4, may appear to be disproportionately long detours. Yet the basic material developed in these chapters is brought together in Chapters 5 and 6 to explain, at the layman's level, how monochrome and color television systems operate. The underlying theme of the volume is the dependence of television systems upon the properties of electrons and other ultimate particles of nature, and this theme is frequently repeated.

The book is written in an easy-going, interesting style: nevertheless the manner of writing is quite different from that of *Engineering Electronics, Principles of Television Engineering,* and other of Mr. Fink's works. Mr. Fink has written competently on technical subjects and was an able editor many years before he became Director of Research for the Philco Corporation; his writings have been well received in engineering circles. But it is a rare authority who can think of quantum steps in terms of people in a football stadium and emerge unscathed. It is in giving Mr. Fink's authoritative statements a new twist that the influence of Mr. Lutyens makes itself most apparent in this compact volume. Mr. Lutyens has taught physics in English universities, was a Visiting Fellow at Harvard during 1957-1959, and has participated in the program of the Physical Science Study Committee.

Is the volume too difficult for use by interested high school students? This reviewer feels definitely that it is not. In an earlier era, motivated high school students were known avidly to read and absorb a good deal of such works as Van der Bijl's *Thermionic Vacuum Tube* and Morecroft's *Principles of Radio Communication,* which, in a very real sense, helped pave the way for modern television. The television book by Fink and Lutyens is very much less difficult than those two technical works and a good deal more lively.

CACHE LAKE COUNTRY, LIFE IN THE NORTH WOODS, by John J. Rowlands, illustrated by Henry B. Kane, '24; Wilderness Edition, W. W. Norton & Company. *Reviewed by Frederick G. Fassett, Jr., Dean of Residence.*

KNOWN for a classic within months of its appearance in 1947, *Cache Lake Country* now attains full recognition of that estate, with the publication of this "Wilderness" edition, in which the original text and illustrations are kept intact, and are preceded by a warm and perceptive foreword by the author. Whoever has smelled woodsmoke at twilight, or tensed to the nearing rumble of rapids yet to be run, or treasured the stillness of the tall green timber on the far side of the mountain will salute this new edition of a book that rightfully stands with Kephart and Stewart Edward White on many a fortunate special bookshelf.

Chief Tibeash, and Hank, and the bush pilots — the cabins aloof enough, but neighborly — the many things to do — the march of the months and the recording thereof in beast and bird and tree — it is all here, and with an even greater evocativeness.

*Technology Review, Feb. 1957, p. 194, and July, 1957, p. 501.

Russia's Challenge in the 1960's

History appears to have decreed that we must continue to pioneer—this time in engineering increases in our productivity

BY WALT W. ROSTOW

IN COMPARING the United States and Russia, we are looking at societies at quite different points in their evolution. The patterns of American and Russian evolution, moreover, present both startling similarities and persistent differences.

The old image of Russia as a nation where the population was vastly greater than our own is no longer correct. Between 1939 and 1959 the Russian margin in population size over the United States decreased from 46 to 18 per cent.

The Soviet Union has devised a framework of education and administration, compulsion and incentives, which yields men and institutions capable of operating a modern, rapidly growing economy. Although Russia is likely to remain more heavily dependent than the United States on its railway network, the rate of Soviet gross investment is likely to remain slightly above the American rate, Soviet industrial output is likely to continue to increase, and a rise in the Soviet standard of living from something like one-third to about 40 per cent of the American level is to be anticipated over the next decade.

Professor Rostow recently summarized comparisons of the economies of the United States and Russia, and drew policy implications from them, for the Subcommittee on Economic Statistics of the Joint Economic Committee of the U.S. Congress. This article was drawn from that document, which has been published in full by the committee.

Sketch by courtesy of *The Economist* (London).

Our Economy's History

American industrialization took hold seriously in the two decades before the Civil War. This period of American take-off centered on the building of a rail network. This enterprise created a national market and brought to life vigorous modern coal, iron and heavy engineering industries. By about 1900, the American economy was technologically mature.

Technological development proceeded, of course, as the new possibilities of electricity, chemicals, and the internal combustion engine unfolded, but Americans turned their minds increasingly to the larger purposes for which this mature establishment should be used.

When the possibilities had been sorted out, Americans decided to use their industrial machine to create a new way of life, based on the mobility which the mass diffusion of the automobile could afford, on the single family home in the suburb, and on the ample use of electrical and gas-powered household gadgets. This was permitted by and further stimulated rapid growth in some important manufacturing industries. Then, during the decade after World War II, Americans began to behave as if they preferred larger families to an increase in income along familiar lines. As incomes rose, our people tended to spend the increase on various kinds of services rather than on manufactured products. Finally, we built up vast requirements for social overhead capital: to round out the new suburbs, to reconstruct the old city centers, and to meet the requirements for the enlarging population.

Russia's Later Start

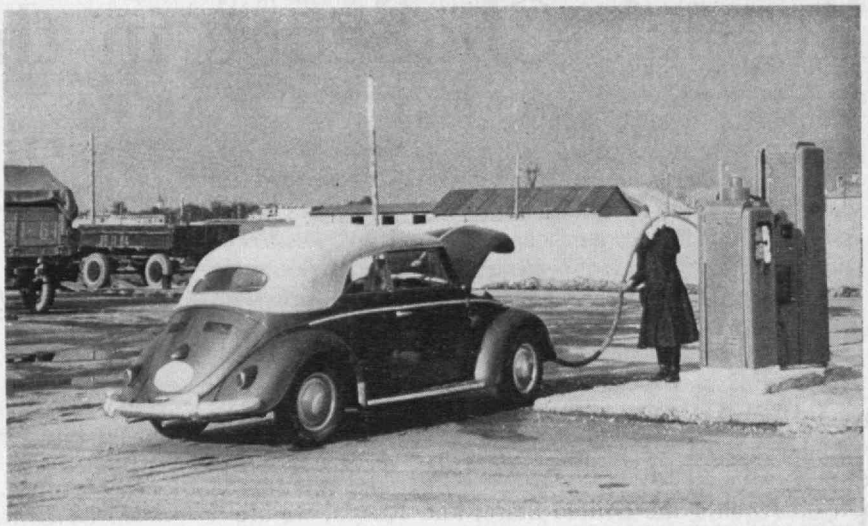
Russian industrialization took a firm grip some 40 years after the process had begun in the United States. Its first phase centered, too, about the rapid building of a railway network. Russia now is roughly at the level of the United States in the first decade of the Twentieth Century – but it comes to maturity at a different, more advanced level of technology. And Russia, like the United States, confronts the question: To what larger purposes should its mature establishment be put?

To enlarge Russian power on the world scene? To soften the harshness of the drive to maturity? Or to enlarge consumption? Before examining the balance that Soviet policy has struck among these three alternatives in the 1950's, let us look back at the principal differences between Russian and American growth.

Russia began with a monarchy which in many ways obstructed the road to modernization. It faced, as well, intractable problems of land tenure, an illiterate serfdom, overpopulation of the land, lack of a free-wheeling commercial class, and a culture which ini-

tially placed a low premium on modern economic activity.

Consumption in America, at each stage of growth, was higher than in Russia. The drive to maturity there took place in a virtually closed economy, against a background of war and preparations for war, and with severe restraints on consumption. In housing, the Soviet Union lived substantially off the Czarist capital stock down to recent years. In agriculture, it invested heavily but within a framework of collectivization that kept productivity pathologically low, and Russia has invested very little in a modern road system.



This filling station in Russia (photographed by Nelson Lees, '53) has few frills.

Thus, the statistical equality in historical pace between Soviet and American industrialization has been achieved by a radically higher proportion of Soviet investment in the heavy and metalworking industries than in the United States, imparting a major advantage to Russia in indices of industrial growth. And this difference was reinforced by two further technical factors enjoyed by any latecomer: the ratio of net to gross investment during the industrialization drive was higher in Russia than in the United States, and the pool of unapplied technical possibilities was greater than in the United States. On the eve of the 1960's, we must assume that the Russian rate of growth will continue to be higher than the American.

Russia's Objective Now

Since 1953, the Soviet Union has reduced the harshness of police state rule and increased the level of consumption to a degree; but its basic decision has been to use the annual increments in production to maintain a very large military establishment and to continue pressing for enlarged power on the world scene.

Quite consciously, Soviet policy is postponing the age of the mass automobile and the single family home in order to bid for primacy in world power. Technically, this has meant that a much higher proportion of Russian investment than American has continued to go into manufacturing sectors rather than into construction and services. It is this relative concentration of Soviet investment, especially in industry related to military potential, which largely explains the higher Soviet than American rate of growth, now and for the next decade.

The arrival of Russia at technological maturity means that the Soviet Union has the resources and technological capacity to mount a wider variety of military and economic programs than in the past. The main weight of Soviet policy is being articulated to the Russian people and to the world in terms of a nonmilitary struggle, but there are no grounds for building American policy on the assumption that, if the Soviet government believed it enjoyed a sufficient advantage in nuclear weapons to take out American retaliatory power at a blow, it would not do so.

Similarly, there is no evidence that the use of arms short of an all-out atomic war has been ruled out. Since the early months of 1956 down through the Berlin crisis, the Soviet Union has on a number of occasions used the threat of its missile capabilities to strengthen the hand of its diplomacy. It is quite evident that the Communists expect a repetition in some form in Asia, the Middle East, Africa, and parts of Latin America of the story of China from, say, 1927 to 1949; and it is clear that Soviet policy is alert to the possibility of exploiting schisms among the western European nations and between western Europe and the United States.

In support of these various efforts to achieve or to prepare for a break-through to world primacy, the Soviet Union is mounting a remarkable and sustained effort to project to the external world and to the Russian peoples a quite particular image. That image is of an ardent, energetic, and technically competent competitor, closing fast on and preparing to supersede a front runner who has lost his capacity to deal with his problems and prefers to go down in the style to which he has become accustomed rather than maintain his position. This campaign has its foundations in a somewhat dubious numerical approach to "catching up" with the American economy, an exceedingly solid set of Soviet achievements in missiles technology, (military and nonmilitary), and a sporadically successful projection of the Soviet Union as the leader in the quest for peace.

The American Agenda

In the light of the purposes of our society, at home and on the world scene, what lines of action are suggested, and what role, if any, does the growth rate and economic policy play in shaping an effective American response?

The elements of an effective American military and foreign policy are, I suspect, quite clear and likely to command something of a consensus. They come to this: By our military dispositions, we must continue to make either major or limited war an irrational undertaking for the Communists, and use our economic resources and our political and human insight

to the full in doing what we can to ensure that the nations of Asia, the Middle East, Africa, and Latin America remain independent and move through their difficult transitions to modernization in ways which keep open the possibility of a democratic evolution for their societies. We must form a new set of relationships with the resurgent nations of western Europe and Japan, and we must maintain an endless diplomatic initiative and an endless sympathetic dialogue with the Soviet leadership, seeking to exploit every serious possibility for movement towards the effective international control of armaments.

It is perfectly clear that the United States is not so poor that it cannot pay the bill for an adequate national effort; nor does the difficulty lie in the potentials for American growth over, say, the next decade. The problem lies in the attitudes of mind and the procedures we bring to bear in allocating resources for public purposes, and in the way we are seeking to handle the problem of inflation.

The working concepts of modern economics encourage the view that public outlays should be accommodated to the natural ebb and flow of the private sector, perhaps to be expanded at times of recession, certainly to be restrained when the private sectors exhibit high momentum. This perspective, carried over inappropriately from an era of depression and peace to a time of chronic cold war and secular expansion, constitutes a powerful deterrent to outlays in the public sector, especially at a time of chronic prosperity. It is not the Soviet growth rate we need to fear, but a mode of American allocation which tends to imprison us.

Russia postponed new housing until recent years. This construction work was photographed last summer by Albert G. H. Dietz, '32, Professor of Building Engineering.

The allocation problem has been made more difficult in recent years by the way we have thought and acted with respect to inflation. The debate on inflation has been dominated by men whose training has led them to examine prices almost wholly in terms of effective demand. One school says that effective demand must be restrained by fiscal and monetary means if prices are to remain constant, even at the cost of a low rate of growth. The other school says that effective demand must be sufficient to maintain full employment and rapid growth, even if this means a steady rise in prices. Both lines of thought derive directly from the experiences and concepts of the interwar years.

Hedges Perpetuate Inflation

It is time that we freed ourselves from the vocabulary and concepts and quarrels of an earlier generation. The inflation problem of the 1950's is only superficially to be analyzed as the product of a peculiar wage push or effective demand pull. More fundamentally it arises from an historical change in the institutional methods and attitudes brought to bear in setting industrial and farm prices on the one hand, and wages on the other, that renders it difficult to pass along productivity increases in lower prices.

The common expectation is that prices can only move in one direction: up. This throws almost the whole burden of achieving a rise in real wages on money-wage negotiations, where the expectation is that money wages also can only rise. This expectation forces businessmen to seek to hedge, in order to protect their profits, and labor leaders to hedge in order to protect the real wages of labor.

Wage negotiations are complicated because business negotiators must try to discount the effect of probable wage increases and labor negotiators must try to discount the effect on real wages of probable price increases. In trying to hedge against inflation, they perpetuate it at the expense of the public interest.

The existence, as it were, of a firm price floor is compounded by a second major institutional fact: money-wage bargains are struck in a setting largely divorced from price policy – and from the course of average national productivity – where the negotiators feel little responsibility except a short-run responsibility to their immediate constituents.

The Productivity Problem

The challenge confronting our democracy is to change the setting in which price and wage policies are established and to make the public interest and public presence felt. We must fashion price and wage policies under chronic high-employment conditions which are judged equitable, and which allocate increases in real income by some method other than the one we now have. It is an often forgotten lesson of economic history that periods of relative peace in labor relations have tended also to be periods of declining trend in living costs.

As one examines economic growth in the past, it is possible to identify sectors whose disproportionately

(Continued on page 46)

Astronomy's Most Fascinating Problem

Is the origin and evolution of the solar system . . . now new knowledge of the stars in general can be applied to it

BY OTTO STRUVE

IS THE solar system unique in our galaxy? This basic question confronts the astronomer when he attempts to discuss the origin and evolution of the sun, its nine attendant large planets and their satellites, its many minor planets and meteors, its 100 billion comets, its dust, and its hydrogen gas (which remained undetected until scientists of the Naval Research Laboratory mounted spectrographs in high-flying rockets a few years ago).

Of all the many problems of astronomy, the origin of this, our solar system, is the most fascinating by far. Every astronomer, no matter what his special work, has thought about it and probably has hoped to contribute directly or indirectly to its solution.

As astronomers, we pride ourselves in being disciples of the oldest science. This has its advantages, but it also brings a tendency to become steeped in tradition. When Immanuel Kant laid the foundations for all later cosmogonical speculation, a great deal already was known about the properties of the solar system, but hardly anything about the fixed stars. It was natural then to concentrate upon trying to explain the regularities which had been observed in the orbits of planets, their axial rotations, their satellites, and so on. Hypothetical primordial media and events were adjusted by later workers in such ways as to permit the authors of the various hypotheses to deduce many, if not all, of the observed regularities. No one knew whether such formations and events could really have occurred, and if observations failed to reveal any like them, there was always the comforting excuse that for all we knew the solar system might be unique.

Dr. Otto Struve, 1959 Compton Lecturer at M.I.T., directs the National Radio Astronomy Observatory at Green Bank, W.Va.

Now "the local swimming hole" — to use an expression coined by Walter Baade to describe a region surrounding the sun to a distance of about 300 light-years — has been fairly well explored, and the more we have learned about the stars, the more we have realized that the sun is a fairly normal star — a relatively cool dwarf, having about the usual three physical parameters for its type:

A mass of 2×10^{33} grams;

A radius of 7×10^{10} centimeters; and

An energy output of 4×10^{33} ergs per second.

Billions of stars resemble it, and must have originated in the same way.

From our nearest stellar neighbor, Alpha Centauri, about four light-years away, the sun would appear as a fairly bright star, and the planet Jupiter about four seconds of arc away would be completely lost in its glare. It is, therefore, not surprising that no one ever has seen or photographed a planet belonging to a star other than the sun; the limitations of our instruments account for this.

No one has seen an electron, yet no physicist doubts its existence, and no astronomer doubts that other stars have planets even though the observational evidence as yet is wholly negative.

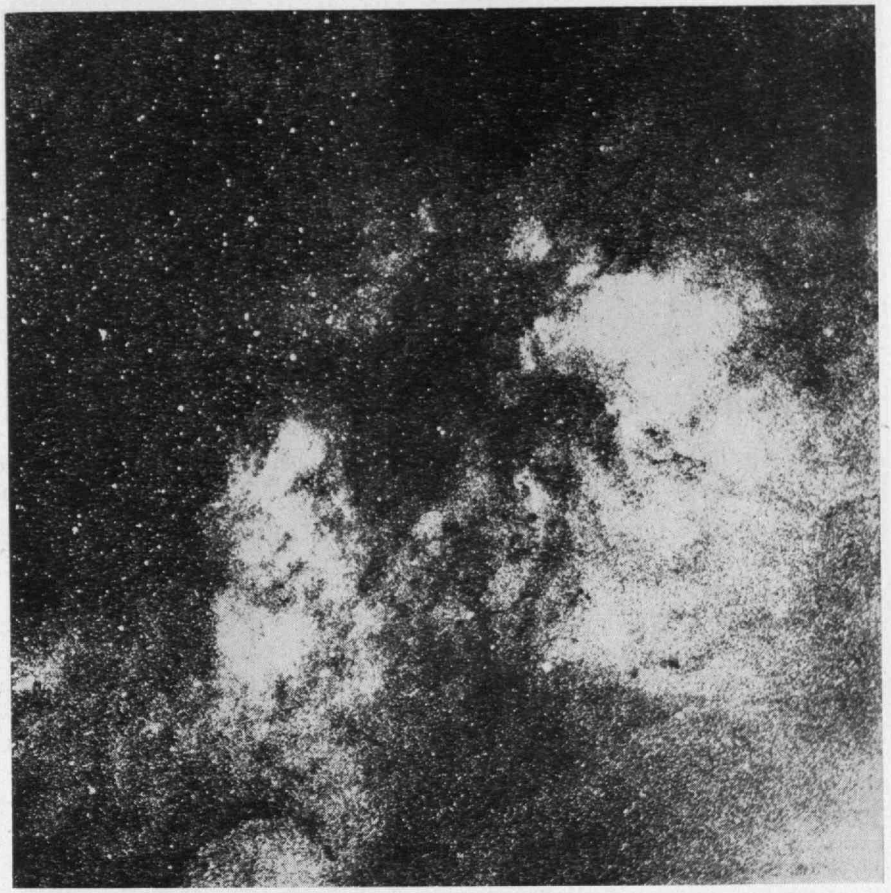
There are perhaps methods that may in the not distant future enable us to discover such planets — by observing the decrease in the apparent brightness of a star when a planet eclipses 1 per cent of it, or by observing the small orbital motion of the star in the period of the planet by means of the Doppler effect. It also has been suggested that a large telescope, equipped with coronagraph techniques and mounted in a space satellite, might be capable of recording directly the faint light of a distant planet.

Meanwhile we know that a hpyothetical observer on Alpha Centauri would be able to establish that the sun has a surface temperature of about 6000 degrees Kelvin, and that its Fraunhofer absorption lines are exceedingly sharp and narrow. If his spectrographic techniques resembled ours, he would conclude that the sun rotated very slowly around its axis (otherwise its absorption lines would appear conspicuously blurred), and he might even succeed in determining that

the sun's rotational velocity at the equator is only two kilometers per second.

This would not disturb him: He would know, as we do, that all the rest of the cool dwarfs in the galaxy which are not members of close double-star systems have slow axial rotations. He also would know that many other stars, much hotter than the sun and several times greater in size, usually have equatorial velocities of the order of 100 kilometers per second, and in exceptional cases even 500 kilometers. But if he knew anything about the cosmogonical theories of our predecessors he would probably immediately discard all those which attribute the origin of the planets to a rapidly spinning star of the solar type — because there just aren't any such stars among the billions of cool dwarfs in our galaxy.

He might be tempted, of course, to believe that the old Laplacian ideas could be applied to those non-solar type stars which have rapid rotations. Those whose equatorial velocities are of the order of several hundred kilometers can be shown to be unstable at their equators and they do, in fact, shed gas in the form of a narrow, disc-like nebula. But the density of these formations is exceedingly small — too small, apparently, for planets to be formed out of them.



This cloud of stars is seen looking toward the center of the Milky Way. Photo was made in Russia and is reproduced by courtesy of *Sky and Telescope*.

The Cells of Stars

The study of the stars, we see from this excursion, must have a bearing on the development of cosmogonical thought. Since all those properties of the sun which we can observe in other stars are normal for a very large group of reddish dwarfs in the galaxy — perhaps as many as 50 billion — it is at least plausible that those other properties that we cannot now test outside the solar system are also common to all or most of them. In other words, it is far more reasonable to start with the working hypothesis that planets are normally present in the vicinity of cool dwarfs than it is to suppose that our planetary system is unique or very rare.

If we make this assumption, however, we are immediately led to consider the evolution of the sun and its planets in the light of what we know or surmise concerning the evolution of stars in general. We should satisfy, as nearly as possible, not only our desire to explain the observed regularities in the solar system, but also the observed properties of stars and nebulae in various stages of their evolution.

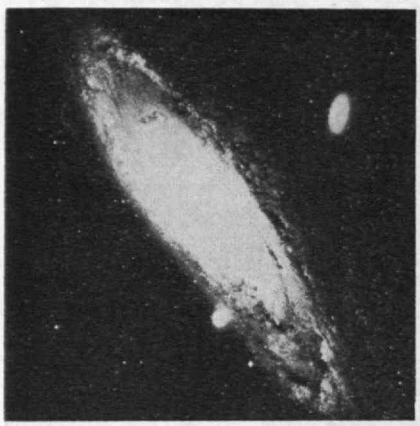
This has required breaking with the old tradition and departing entirely from the conventional form of cosmogonical research. The transition has not been easy.

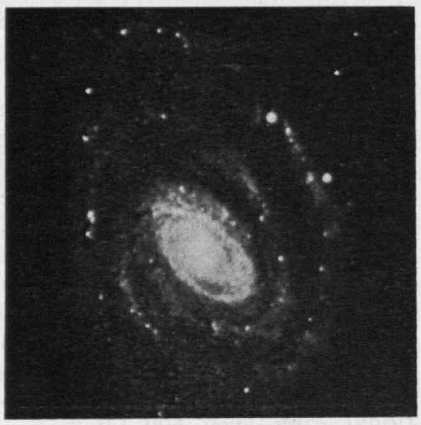
What is the size of the solar system? Until recently, we assumed that the most distant planet, Pluto, marked its outer edge. The astronomical unit is the distance from the sun to the earth, and Pluto is 40 astronomical units from the sun, or about 1/5000th of the distance to the nearest star. No large planetary bodies are known beyond its orbit, but recent work, especially by J. H. Oort of Leiden, has shown that there are some 10^{11} comets belonging to the sun's family which travel in extremely elongated orbits and reach out to distances of the order of 150,000 astronomical units, or more than one-half the distance from us of Alpha Centauri. We must, therefore, assign to the solar system a correspondingly large volume of space.

It looks now as though we can assume, in effect, that interstellar space is subdivided into a large number of adjoining cells, one for each star — which, in "the local swimming hole" of the galaxy, can be represented by cubes with sides measuring roughly four light-years.

In the cell occupied by the solar system, the mass is concentrated almost wholly within the sun; all the planets, satellites, etc., contribute only about one-tenth of 1 per cent. Now if we assume that the solar system condensed out of some primordial diffuse gas, we can derive its original density by spreading out the present mass of the solar system over the volume of the cell. When we do this we find that the number of atoms in the primordial medium must have been of the order of 10 per cubic centimeter.

Is this result reasonable? The answer is decidedly yes: We can measure the number of interstellar absorption lines produced along





As many distant galaxies can be observed as there are stars in Milky Way. *Left to right:* One in Andromeda (in a 48-inch Schmidt photo), a whirlpool galaxy (in U.S. Navy photo) and a spiral nebula in Virgo (in 200-inch Palomar photo).

the entire path between us and some distant star. For "the local swimming hole," this turns out to be about one atom, or somewhat less, per cubic centimeter. The stars evidently have absorbed about 90 per cent of the original gas, leaving 10 per cent in the form of diffuse interstellar gas.

The Tidal Forces

Now we must investigate whether an original medium having the computed density could have coalesced into a star. Let us suppose that an eddy was formed with a density slightly greater but still very close to the average of 10 atoms per cubic centimeter. Could it retain this density and grow by gravitational attraction, and accumulate within its body other atoms or eddies?

It can be shown that tidal forces from the Milky Way as a whole would not disrupt the newly formed condensation, but when the tidal disrupting force of nearby stars is computed I believe that we must conclude that the medium in the cell must already have had some inhomogeneities. This is consistent with the observations of nebulae and interstellar absorption lines, which show that the present medium is highly inhomogeneous and consists of regions of greater and smaller than average densities.

Tidal stability, however, is by no means a sufficient criterion for the formation of a star. A hot gas will expand, not contract, unless the gravitating mass is very great. This argument has been used to demolish all those theories of the origin of planets which attribute them to the condensation of a very hot and large prominence erupted from the sun by the attraction of a passing star.

Only a very cold gas would enable a condensation to grow. Since there is definite evidence that "protostars" in the form of black globules do occur in hot gaseous nebulae, there must be some cooling mechanism such as the formation of dust, or even large meteor-like bodies, that can radiate heat rapidly.

Although not all of the steps we have taken are sufficiently rigorous for a definitive theory, it seems reasonable at this stage to conclude that gravitationally stable condensations of gas can be formed, that they grow in mass, and that they are first seen as cold, black globules when they are projected against the luminous background of an emission nebula.

The Angular Momenta

How, now, shall we proceed with the problem of the origin of planets? The cosmogonical significance of stellar rotational velocities already has been mentioned. High rotational velocities occur only in hot stars, never in cool dwarfs. A table of astrophysical quantities shows an abrupt change, which must be accounted for by some unobservable property.

What it may be is rendered intelligible if we consider what the rotation of the sun would be if there were no planets, and all their orbital (and rotational) angular momenta were added to that of the sun. The planets carry about 98 per cent of the total angular momentum of the system, and the sun only 2 per cent. If the present planets were combined with the sun, its velocity of rotation would be increased by a factor of about 50 and would be close to 100 kilometers per second. The sun then would be a fairly rapidly spinning star and would not differ in this respect from the hotter stars. In all probability, the angular momentum of a star, with or without planets, remains reasonably constant, and the evidence seems to be overwhelmingly in favor of the conclusion that all, or most, solar-type stars possess planetary systems resembling our own.

It is safe to say, in fact, that billions of stars in the Milky Way possess families of planets.

Blobs and Discs

But this does not mean that we yet have explained the mechanism by which planets were formed. Nor have we explained how any star, single or with planets, has acquired an angular momentum as small as that of the entire solar system. Observations of nebulae, out of which the stars were formed, show turbulent motions which would not all cancel out, they would leave more angular momentum than actually is observed.

Suppose that we think of the original cell as consisting of blobs of gas moving about at random. A theory presented at the 1959 Liége Symposium on Stellar Evolution by W. H. McCrea suggests that the original "proto-sun" was an average blob which accidentally coalesced with one or two other blobs, and thus began to serve as a center of attraction for other blobs. By this theory, it is possible to account for the small angular

momentum of the sun and stars like it. Blobs with high angular momenta supposedly formed the planets and their satellites.

Before McCrea's theory became known, the importance of the tidal stability criterion was clearly demonstrated by G. P. Kuiper. No attempt has been made yet to integrate his and McCrea's theories, but it seems to me that they are entirely compatible.

Kuiper assumed that the sun was formed in a fairly dense interstellar cloud, and that a disc-shaped nebula was left which revolved around the sun. The densities of known galactic nebulae are much less than would have been required for the formation of a solar system, and the question arises whether there are any objects in the sky today which resemble the sun while it still had its nebula.

Seen from the earth at a distance of 200 light-years, a nebula with a diameter of 60 astronomical units would subtend an angle of only about one second of arc, and the lifetime of the nebula might be less than 1,000,000 years. Not many stars are near enough to show us such nebular discs if they exist, and even though many may have had such discs once in their long lifetimes, it is not likely that many would be in this state now.

To find a "solar nebula" belonging to another star, a search probably should be made among relatively young stars of about the mass of the sun. It is tempting to suggest that the so-called T Tauri variables are such stars. Their spectra show emission lines which are almost certainly produced in nebulous shells or envelopes. Their central stars have continuous spectra with absorption lines that often appear "veiled," as though the star light were shining through a fairly thick obscuring layer. These absorption lines are usually broad, as though the central stars have large rotational velocities, which perhaps could be explained in terms of a proto-star that had not yet accomplished the separation of angular momentum required by McCrea's theory. . . . And some T Tauri variables have been forming quite recently in the Orion nebula, which long has been regarded as an enormous cauldron in which new stars are being born even at the present time.

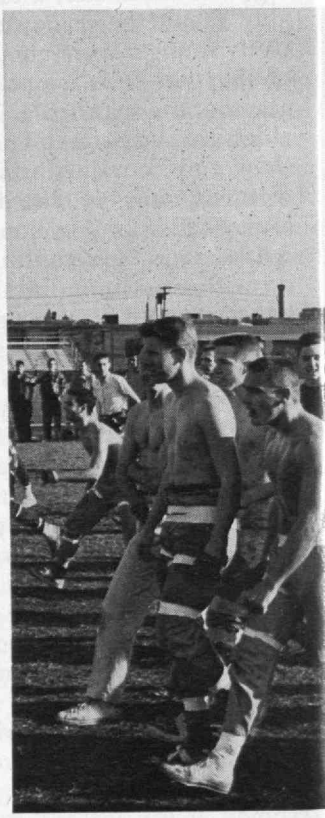
The unusual appearance of this distant galaxy was discussed by Thomas Gold, chairman of the Department of Astronomy at Cornell University during the last of the series of seminars in which Dr. Struve participated at M.I.T.

Space and Basic Science

UNDER the spell of space, with all its glamor and fascination, there is a disposition to count the dollars allotted to space as part of the total dollars we allot to science and basic research, and thus to give a distorted assurance that great sums for space represent greatly increased resources for science. This confusion can lead to a neglect of science at the expense of technology . . .

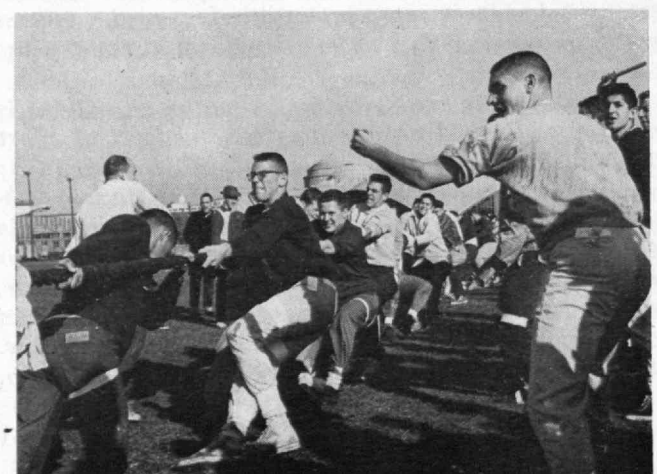
I would like to see some of the excitement and concern we nationally display over space activities focused on our progress and level of effort in basic research, in industry, in the universities, and in government. By strengthening our basic research we can strengthen all our future technology, including our space program; but vigorous basic research will do a great deal more. It will contribute to our industrial advance, to our health, to our education, and in all of these ways to our national poise, prestige and leadership. It will augment the quality of our efforts, and quality must be a top priority goal in every aspect of our national life.

—JAMES R. KILLIAN, JR., '26, in an address to the Nutrition Foundation.



'62 Sweeps Field Day

THE SOPHOMORES narrowly defeated the freshmen on Field Day last November, when R. Boyd Estus, '63, and Curtiss D. Wiler, '63, took these copyrighted photos. Joe Vittek, Class of '62 President, predicted afterwards, "The fire of our class will continue through our years at M.I.T.," and Bob Johnson, Class of '63 President, retorted: "We have but begun to make our mark."

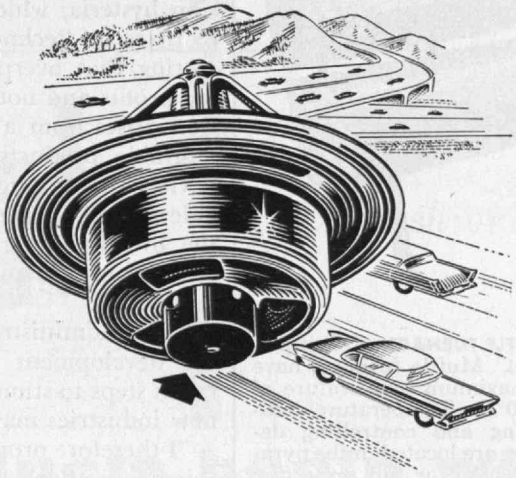


BUSINESS IN MOTION

To our Colleagues in American Business . . .

Of more than the usual interest is the following example of how Revere, a supplier, working with still another supplier, was able to help the ultimate customer produce a superior product for less money.

A manufacturer of automotive thermostats was having difficulty in securing the proper kind of copper cup which is the heart of its newest stat. Originally this cup was machined from free cutting copper rod, but this proved costly due to the high rate of scrap from the machining operation and the relatively high cost of turning out the machined part.



At this point Revere Technical Advisors got together with the engineers of the manufacturer and the possibility of an impact extrusion was discussed. Revere T.A.s in turn contacted suppliers of impact extrusions to see whether or not such extrusions, in copper, could be produced economically and to the demanding specifications required. After testing many types of copper rod it was found that the cups could be impact extruded to meet the exacting hardness required by the specifications.

The impact extruded cups were tested and re-tested in comparison with the machined cups. Many problems involving temper, grain size and control of the chemical composition of the copper rod for impact extrusions had to be solved.

Finally, after repeated tests of samples it was revealed that copper cups extruded from a specific type of copper rod recommended by Revere, were superior from a standpoint of both quality and price.

During the months of development, Revere personnel, on the one hand were working with prospective suppliers of the copper cup and on the other hand coordinating the overall effort with the engineering and purchasing departments of the manufacturer. This, of course, kept them abreast of developments by assisting with the preparation of a material specification that would assure a quality product.

In addition to the Copper Cup, Revere also supplies 70/30 Brass Strip from which other parts of the thermostat are fabricated.

Said the purchasing agent, "When you ask Revere for help you get results. They are so well organized all over the country that they can really do something for you. That's why, through their help on our special type thermostat, we are able to say that it is the most accurate and trouble-free stat ever designed to operate in pressurized cooling systems. The stat will perform accurately and efficiently against high pump pressure and is not affected by action of the pressure cap."

This is still another case of how Revere, a supplier, working with still another supplier, was able to help its customer produce a superior product for less money. And, because practically every industry you can name is able to cite similar instances, we suggest that no matter what your suppliers ship you, it would be a good idea to take them into your confidence.

REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

Executive Offices: **230 Park Avenue, New York 17, N. Y.**

Institute Yesteryears

25 Years Ago . . .

IN The Review for January, 1935, President Karl T. Compton entered a plea for an intelligent attitude toward Science on the part of Government. "There are," he wrote, "some striking anomalies in our national policy which suggest that an important prerequisite to sound and permanent economic recovery has thus far been neglected. I refer to the contributions to national welfare which may be expected of Science, if Science is really put to work.

"It is well known that Science has created vast employment, yet it is not being called upon or encouraged now to create new employment when this is desperately needed! . . .

"Perhaps this neglect is a result of the early depression hysteria, which, looking for a scapegoat, sought to place on 'technology' the blame for the crash, forgetting that overproduction arises from competition for profits and not from Science, that underconsumption arises from a paucity rather than a plethora of desirable products of Science, that the labor-saving devices that spring from Science are inherently desirable if used properly, and, most important of all, that the overwhelming influence of Science has been to create employment, business, wealth, health, and satisfaction . . .

"The Administration is seeking means to stimulate the development of new industries, yet it has not taken steps to stimulate the scientific work from which new industries may be expected to spring! . . .

"I therefore propose a National Program for Putting Science to Work, in four aspects:

"(1) From emergency appropriations for Public Works, allocate half of one per cent for scientific and engineering research looking toward better public works for the future.

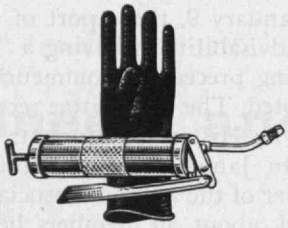
"(2) Appropriate annually the sum of $5,000,000 for the support of important scientific and engineering research outside of governmental bureaus.

"(3) Maintain the staffs and appropriations of the scientific bureaus of the government on a scale adequate for the performance of their essential services with necessary precision and perfection.

"(4) Call on the National Academy of Sciences, and its agency the National Research Council . . . (a) to formulate a program of research in the broad field of Public Works and to advise in the allocation of funds for its prosecution; (b) to formulate policies and procedures for support of research outside of governmental bureaus; . . .

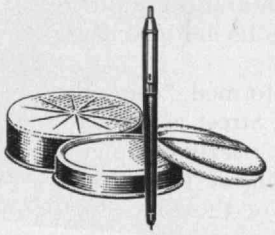
"The public welfare demands a strong, national scientific program; private philanthropy will probably not be able to carry the burden of this program, at least in the near future; the procedure which is here suggested would give a wonderful impetus to our scientific work."

(*Concluded on page 36*)



. . . greases or gloves

. . . pens or powders



. . . varnish or vases

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Phone: Liberty 2-7300

Institute Yesteryears

(Concluded from page 34)

50 Years Ago . . .

CONCERNING the newest edition of the Institute Catalogue, The Review remarked that it enumerated, "210 on the Instructing Staff, of whom 93 are members of the Faculty. There are 4,127 living graduates from the Transvaal to Russia and from Argentine to Nova Scotia."

¶ In January, 1910, A. Farwell Bemis, '93, took office as the 17th President of the Alumni Association, with Franklin W. Hobbs, '89, as Vice-president. Walter Humphreys, '97, was re-elected for a third term as Secretary-Treasurer, in which portfolio he served the Association from 1907 to 1923.

¶ The Technology Aero Club was formed, "using the mechanical laboratory on Garrison Street as an aërodrome, which is now sheltering the nearly completed glider aëroplane." During the spring of 1910, glider flights were made on the grounds of the Brae Burn Country Club, Newton.

75 Years Ago . . .

THE first concert of the Glee Club, assisted by the newly formed Orchestra, was held at Chickering Hall on January 8, 1885; and, according to *The Tech*, "it proved an entire success. There was a full house, and the selections were all liberally applauded. . . . The new musical society, the Orchestra, promises to be a great source of enjoyment and culture among the students."

¶ At a meeting of the Class of 1885 at Young's Hotel on January 9, the report of a committee to consider the advisability of having a "Senior Farewell" on the evening preceding Commencement was received, and accepted. The Committee recommended that the Class elect an Historian, Prophet, Poet, and Chorister.

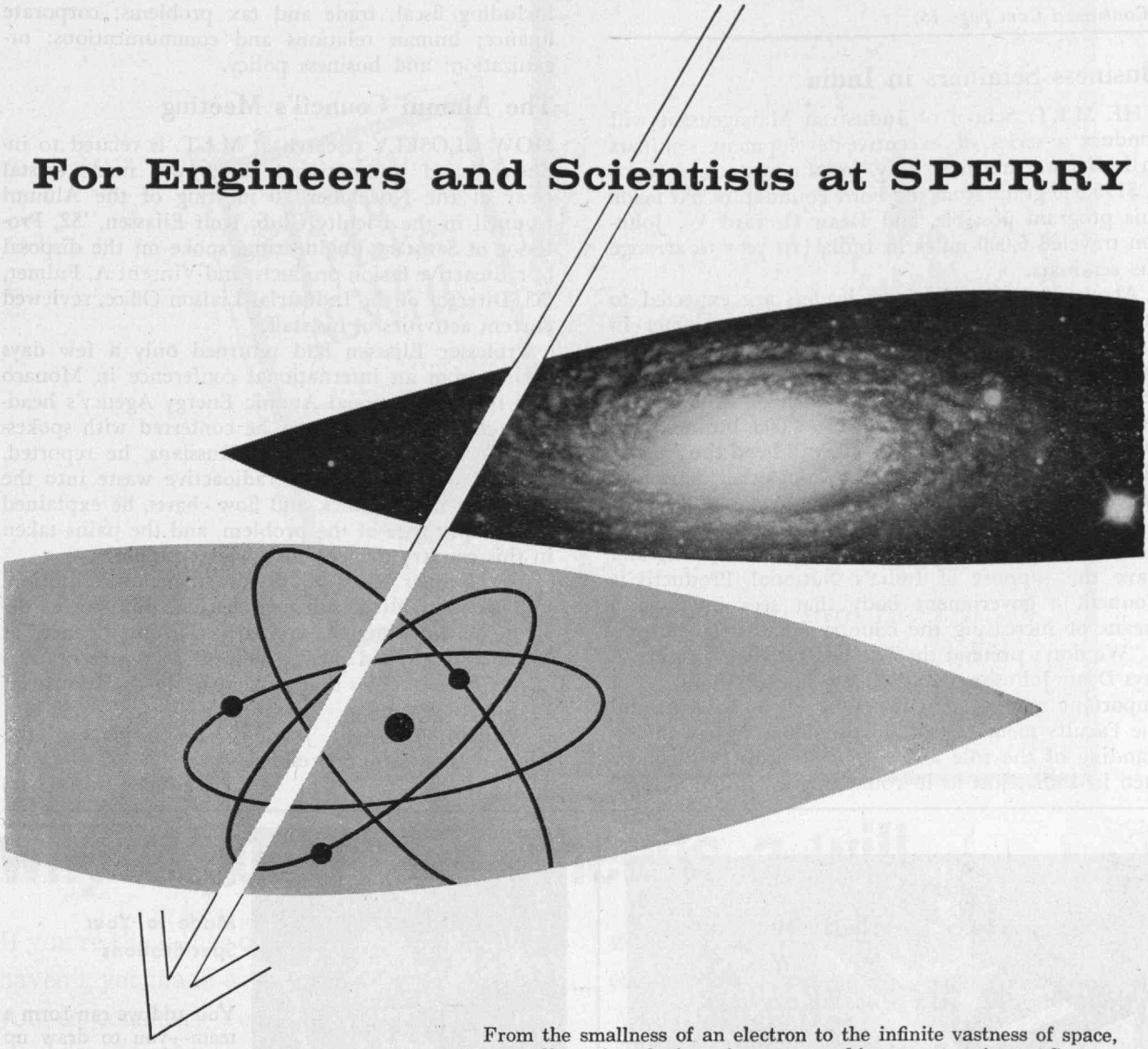
¶ On January 15, the "10th Annual Meeting and Dinner of the Alumni Association was held at Young's Hotel, about 50 members being present.

"The report of the Secretary and Treasurer was read, showing a balance on hand January 1, 1885, of $40.39. The report of the Trustees of the Alumni Fund was read and accepted, the report showing the amount on hand to be $1,084.66."

99 Years Ago . . .

ON January 11, 1861, under the leadership of William Barton Rogers, there took place in the Mercantile Building, 18 Summer Street, Boston, a meeting of persons interested in the formation of an institute of technology. An "Act of Association" was adopted, reading in part as follows: *"Resolved;* That a Committee of Twenty, with power to increase their number, be appointed to represent the interests and objects of the Association, and to act generally in its behalf until it shall be legally incorporated and regularly organized under the title and according to the purposes of the Massachusetts Institute of Technology."

For Engineers and Scientists at SPERRY



engineering assignments ranging beyond today's space age concepts

From the smallness of an electron to the infinite vastness of space, every dimension of science is represented in current projects at Sperry. This diverse selection of work assignments provides engineers and scientists with stimulating, professional-level opportunities to do creative work in a host of areas.

Among the many Sperry projects are: advanced airborne flight data system for manned flight into space; advanced radar early warning systems; advanced electronic and gyroscopic systems connected with the Polaris missile; Terrier, Tartar, and Talos radar guidance systems; and the development of space and armament systems.

At Sperry are found other advantages, too. You have the virtually unlimited facilities and stability associated with a large firm, coupled with the recognition and sense of achievement that comes with work in small, responsible groups. This fact is vividly demonstrated by the record of more than 2600 employees who are 15-year men. For nearly half a century Sperry has grown steadily, and in so doing has provided ever-increasing opportunities for satisfying, rewarding careers in a company famous for its scientific accomplishments.

FOR FURTHER INFORMATION PLEASE CONTACT
MR. J. W. DWYER *EMPLOYMENT MANAGER*

SPERRY GYROSCOPE COMPANY *Division of Sperry Rand Corp.*
GREAT NECK, LONG ISLAND, NEW YORK · Fieldstone 7-3665

(Continued from page 16)

Business Seminars in India

THE M.I.T. School of Industrial Management will conduct a series of executive-development seminars in India, starting next July, for the next three years. A $175,000 grant from the Ford Foundation has made this program possible, and Dean Howard W. Johnson traveled 6,000 miles in India last year to arrange the seminars.

About 30 Indian business leaders are expected to attend the first four-week seminar next summer in the Palace Hotel, in Srinigar, the capital of Kashmir-Jammu. It will be followed by two one-day conferences in other Indian cities, each of which is expected to be attended by about 1,000 businessmen. Dean Emeritus E. P. Brooks, '17, will head the Faculty group, which will include men from other American universities as well as M.I.T.

The courses were proposed to the Ford Foundation by the All-India Management Association, and have the support of India's National Productivity Council, a government body that sees in them a means of increasing the country's industrial output.

"We don't pretend that we can provide 'answers,'" says Dean Johnson. "Rather, the joint exploration of important management issues by the executives and the Faculty members should provide a clearer understanding of the role and responsibilities of businessmen in India, just as it would in the United States."

Topics to be covered are: management economics, including fiscal, trade and tax problems; corporate finance; human relations and communications; organization; and business policy.

The Alumni Council's Meeting

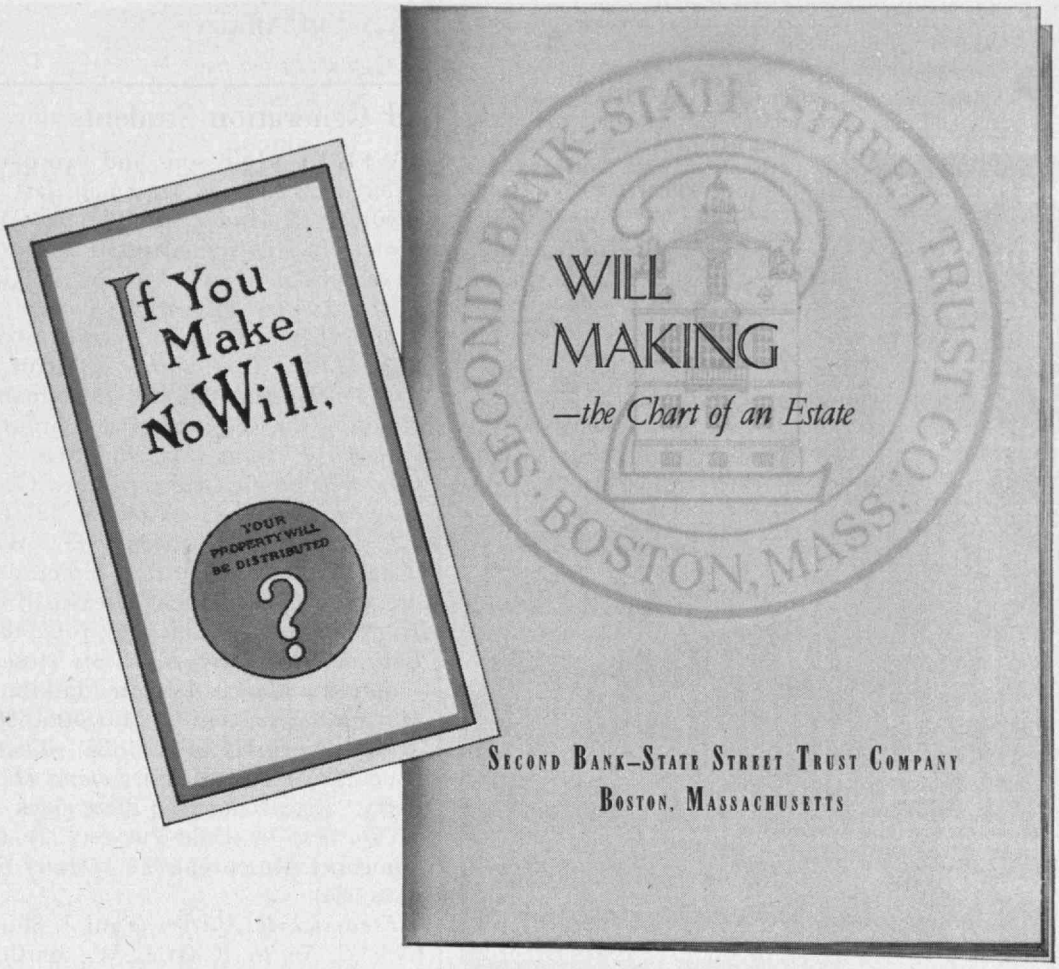
HOW CLOSELY research at M.I.T. is related to industrial and international affairs was made crystal clear at the November 30 meeting of the Alumni Council in the Faculty Club. Rolf Eliassen, '32, Professor of Sanitary Engineering, spoke on the disposal of radioactive fission products, and Vincent A. Fulmer, '53, Director of the Industrial Liaison Office, reviewed current activities of his staff.

Professor Eliassen had returned only a few days earlier from an international conference in Monaco and the International Atomic Energy Agency's headquarters in Vienna, where he conferred with spokesmen for many nations. The Russians, he reported, opposed any dumping of radioactive waste into the sea. With maps, tables, and flow charts, he explained the complexities of the problem, and the pains taken in this country to store such wastes properly.

Mr. Fulmer cited work on flame stabilization, radiation shielding, soil engineering, fluid-power devices, machine design, and artificial intelligence, at M.I.T., which had proven helpful to representatives of the 90 companies that participate in the Industrial Liaison program.

William W. Garth, Jr., '36, Vice-president of the Alumni Association, presided.

(Concluded on page 40)



why a young man needs a will

If you're the father of young children and you haven't yet made a will, here's a thought for you to consider. Young people like yourself need a will perhaps even more than older men. While your children are growing, with their education and training ahead of them, it's especially important that plans be made for their protection should anything happen to you.

Where there's a will there's a way to conserve the assets of your estate for the benefit of your family. And it's a way of making sure that your wife won't have to cope with the problems of estate administration all by herself.

Whether your estate is large or small, ask your lawyer why you should have a will and why you should appoint an experienced executor and trustee like Second Bank-State Street. If you'd like some helpful information about this important subject, ask us for a copy of our booklet, "Will-Making — the Chart of an Estate."

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Trend of Affairs

(Concluded from page 38)

2d Generation Students

TWENTY-NINE sons and two daughters of Alumni entered M.I.T. as freshmen last fall. They were: *Thomas R. Anderson* (Thomas W. Anderson, '37), *Marcia J. Arentzen* (Captain Edward S. Arentzen, '43), *Arsine V. Avakian* (Arra S. Avakian, '33), *John D. Barnard* (Lawrence B. Barnard, '31), *Yuan H. Chu* (Lan J. Chu, '35), *Theodore E. Cohn* (Nathan Cohn, '27), *Martin C. Cosgrove* (Martin F. Cosgrove, '34), *Eric R. Cosman* (Bernard J. Cosman, '36) *Frederick E. Cunningham* (Frederick W. Cunningham, '25).

Roger F. Gans (Mr. and Mrs. Frederick C. Gans, '34), *Kimon T. George* (James George, '30), *Neil S. Golden* (Dr. Maurice Golden, '32), *Frank R. Heselton, Jr.* (Frank R. Heselton, '33), *Ward A. Holdrege* (Charles F. Holdrege, '29, father, and Henry A. Holdrege, '95, grandfather [deceased]), *William L. Klehm, Jr.* (William L, Klehm, '35), *Jonathan S. Lane* (Harold Lane, '32), *Roberto L. Levis* (Joseph L. Levis, '26).

Stephen Malkin (Simon Malkin, '34), *Salvatore G. Mazzotta* (Sebastian G. Mazzotta, '36), *Christopher R. Miller* (Noel H. Miller, '26), *Theodore T. Packard* (Lucius E. Packard, '35), *Leland H. Perry* (Lyndall R. Perry, '27), *Michael E. Platt* (Jack Platt, '34), *Austin M. Purves, 3d* (Dale Purves, '23), *Carl D. Rosenthal* (Simeon I. Rosenthal, '33), *Daniel R. Ross* (Adrian E. Ross, '34).

Frederick R. Shirley (Paul J. Shirley, Jr., '38), *William C. Smith* (Charles W. Smith, '35), *George R. Thomson* (George Thomson, '21 [deceased]), *Thomas C. Vicary* (James W. Vicary, '33), and *Barry Warner* (Edward P. Warner, '17 [deceased]).

News You May Have Missed

IN 1958, when the Donner Foundation of Philadelphia granted $2,500,000 to M.I.T. and four other universities for professorial chairs in science, it was stated that the funds would be paid over a five-year period, but the grants now have been paid in full.

Production of synthetic penicillin for medical use was announced last fall by Bristol Laboratories, which provided financial support for the research at M.I.T. of Professor John C. Sheehan, who first made penicillin by synthesis.

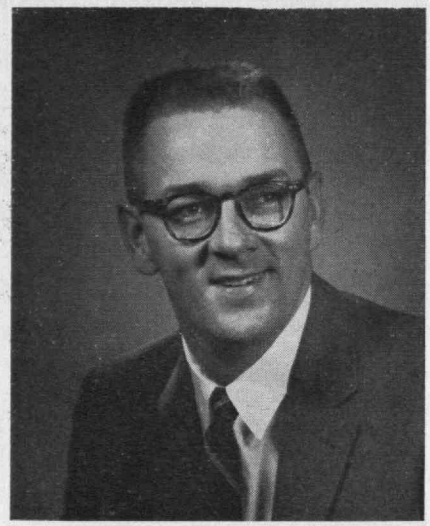
Individuals Noteworthy

(Continued from page 8)

Alumni Fund Man

THIS WINTER Douglas F. G. Haven, '52, has joined the staff of the Alumni Association as Regional Director of the Alumni Fund. He has taken over this post from Joseph E. Conrad, who resigned to become Director of Development at Stephens College in Missouri.

Mr. Haven is a graduate of Course XV. As an undergraduate he was active in sports and dramatics. A member of the Lacrosse Team for four years, he is wearer of the straight "T." He was active in Drama Shop, the Glee Club, and his four years of Tech Show activity culminated in his election to the post of general manager and director in his senior year. He was a member of Theta Chi and Beaver Key.



Douglas F. G. Haven, '52

After a period with Du Pont, Mr. Haven joined the Cryovac Division of W. R. Grace Company. Before returning to Cambridge his activities included sales and sales engineering of food packaging films in Cryovac's Midwestern District.

Mr. Haven is the son of Franklin K. Haven, '23; the grandson of the late Harry M. Haven, '95, and a nephew of Roger W. Haven, '28, and Dr. Gilman W. Haven of the M.I.T. Infirmary.

At the final Alumni Council meeting attended by Mr. Conrad, he was given a set of M.I.T. plates in appreciation of his services.

New Positions

ALUMNI who have moved into new positions in recent months include:

Willard C. Brown, '16, as President, United National Committee of the International Commission on Illumination . . . *Ernest C. Gagnon, '16,* as President, Farmers and Merchants Bank of Hurtsboro, Ala. . . . *Raymond H. Blanchard, '17,* as President, Associated Industries of Massachusetts;

Lewis W. Douglas, '17, as Trustee, Mutual Life Insurance Company . . . *Edward J. Hanley, '24,* as Board Member, Pennsylvania Railroad . . . *Harold H. Belcher, '25,* as Vice-president, Rodney Hunt Machine Company;

Mary Morrison Kennedy, '25, as a Vice-president, Sheraton Corporation of America . . . *William J. Mahoney, '25,* as President, American Coal Company . . . *Ralph B. Johnson, '27,* as President, Hawaiian Electric Company, Ltd.;

Herschel Y. Hyde, '28, as Board Member, Tidewater Oil Company, . . . *John J. Wilson, '29,* as Advisory Board Member, Colonial Energy Shares, Inc. . . . *S. George Lawson, '30,* as Manager, Semi-Conductor Division, Sylvania Electric Products, Inc.;

Myron T. Smith, '30, as Director of Sales, General Radio Company . . . *Charles E. Starr, Jr., '31,* as Deputy Co-ordinator, general administration unit, Esso Research and Engineering Company . . . *Richard M. Stewart, '32,* as Chief Executive Officer, American Brass Company;

John King, '33, as Product Development Engineer, Master Builders Company . . . *William J. Suchors, '35,* as Executive Assistant to Executive Vice-president, Remington Rand Division, Sperry Rand Corporation . . . *R. B. Woodward, '36,* as Board Member, Dreyfus Fund, Inc.;

Major General James McCormack, '37, as Director, Perkin-Elmer Corporation . . . *Rear Admiral Richard S. Mandelkorn, '37,* as Executive Vice-president and General Manager, Harris Transducer Corporation . . . *Phillip R. Scarito, '37,* as Vice-president, Cary Chemicals;

Major General August Schomburg, '38, as Head of Army's Missile Command . . . *George Beesley,*

'39, as Director and Vice-president, Servend, Inc. . . . *Harry A. Ferullo, '40,* as Weapons Systems Manager, Missiles and Space Systems Division, United Aircraft Corporation;

John H. Halford, Jr., '40, as Assistant Director of Research, American Optical Company . . . *Austin W. Fisher, '41,* as Vice-president and Director of Research, Ludlow Papers, Inc. . . . *George F. Quinn, '41,* as Director of Production Division, Atomic Energy Commission;

Edward F. Thode, '42, as Chief of Pulping and Papermaking Section, Institute of Paper Chemistry . . . *Richard E. Elden, 2–44,* as Resident Manager, Becco Chemical Division, Food Machinery and Chemical Corporation . . . *Edmund C. Gaulden, '46,* as Associate Medical Director, J. B. Roerig and Company;

Thomas Hudson, Jr., '49, as District Traffic Superintendent, Main Line, Bell Telephone Company of Pennsylvania . . . *Myles Maxfield, '50,* as Chief, Physical Science Division, Fort Detrick, Frederick, Md. . . . *Howard L. Smith, '51,* as Assistant Director, Jackson Laboratory, Organic Chemicals Department, E. I. du Pont de Nemours and Company;

FOR ASSISTING science education, an award was presented to Paul J. Cardinal, '24, Vice-president in charge of industrial relations of Hoffman-LaRoche, Inc., by the New Jersey Science Teachers Association. At left is William L. Davidson, the Association's retiring President. Mr. Cardinal's company has helped students enter science fairs, arranged plant tours, supplied speakers on scientific subjects and helped in many other ways to advance the teaching of science in the schools.

Arthur S. Chivers, '52, as Manager, Western Division, Barry Controls, Inc. . . . *Stephen J. Jatras, '52,* as Director of Engineering, Lockheed Electronics and Avionics Division . . . *Robert W. Dickinson, '53,* as Director, Sodium Reactors Department, Atomics International Division, North American Aviation, Inc.

In Print

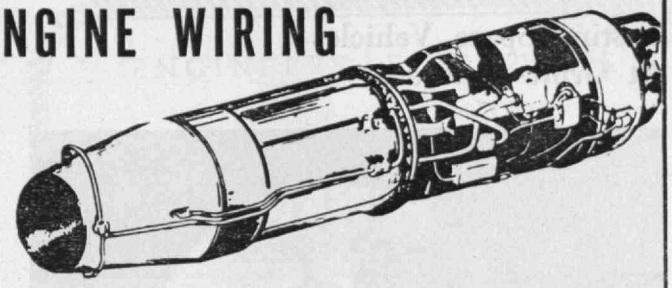
Ralph M. Evans, '28, of the Eastman Kodak Company, is the author of *Eye, Film, and Camera in Color Photography,* a 410-page work published at $8.95 in September by John Wiley & Sons, Inc., New York.

Charles B. Westbrook, '46, of the Wright Air Development Center, contributed an article on "The Pilot's Role in Space Flight" to the November, 1959, issue of *Aero-Space Engineering.*

Samuel C. Collins, Professor of Mechanical Engineering, is the author of a paper on "The M.I.T. Helium-Hydrogen Liquefier," published in a volume on *Problems of Low Temperature Physics and Thermodynamics,* by Pergamon Press, Inc., New York.

Juris Smiltens, '56, of the Air Force Cambridge Research Center, was one of the editors of a volume on *Silicon Carbide,* published by Pergamon Press, Inc., New York.

NEW HORIZONS IN JET ENGINE WIRING



BIW now offers MIL Spec approved wire for high temperature and fire resistant applications. This wire was developed after exhaustive testing of the very best materials available. They have been combined so as to provide a new wire which not only exceeds the MIL spec requirements initially, but continues to give superior performance over a longer period of time. To those with high temperature problems, this means greater reliability, less down time, reduced replacement costs, improved products and more profits.

Test information is reported briefly in the following table:

TEST	CONDITIONING	SPEC. REQUIREMENT	TYPICAL TEST RESULTS
Wet Dielectric	5% salt water solution immersion for 1 hour.	.5 ma max. leakage at 1500 V RMS.	0 leakage.
Flame Resistance	Aircraft Engine Fuel immersion for 24 hours. 2000° F flame for 5 minutes.	No falling particles. 8" max. flame travel. 125V AC test after flame .5 ma max. leakage.	No falling particles. Min. flame travel. Breakdown 500 V Leakage .0085 ma.
Flame Resistance	50% Kerosene and Engine Lubricant vapors at 250° F for 4 hours. 2000° flame for 5 minutes.	Same as above.	Same as above.
Low Temperature Flexibility	−65° F for 2 hours on mandrel.	No cracks after returning to room temp. Pass Wet Dielectric test.	No cracks. 1500 V test O.K. Leakage .06 ma.
High Temperature Operation	Current applied to stabilize temp. at 750° F for 48 hours. Ambient temp. 450° F.	Same as above.	No cracks. 1500 V test O.K. Leakage .20 ma.
Abrasion	Same as above.	MIL-T 5438 Equipment. #16AWG=30"	#16AWG=60"

BIW qualification approval was granted on February 16, 1959. The basis for this approval along with BIW Pt. #Pt #'s and official designation for the approved types and sizes has been put in tabular form below for your ordering convenience.

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Cable, Electric, Aircraft, High Temperature & Fire Resistant

Approved Basis

WCLK-TM-59-26 Dated 16 Feb. 1959

AWG SIZE	BIW PT#	APPROVED DESIGNATION
20	2610-R-G20	20-25038-STA
18	2611-R-G18	18-25038-STA
16	2587-R-G16	16-25038-STA
14	2768-R-G14	14-25038-STA
12	2612-R-G12	12-25038-STA

WCLK-TM-59-27 Dated 16 Feb. 1959

AWG SIZE	BIW PT#	APPROVED DESIGNATION
10	2769-R-G10	10-25038-STA
8	2589-R-G08	8-25038-STA
6	2770-R-G06	6-25038-STA
4	2771-R-G04	4-25038-STA

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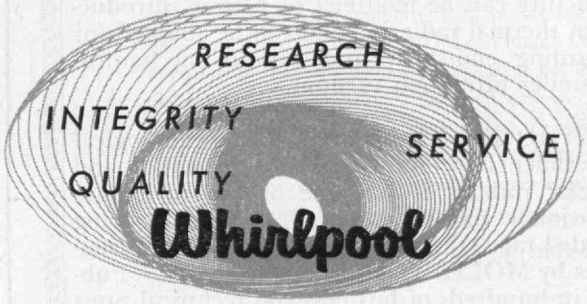

Washington – a magical word in America. It brings to mind the man of integrity, the city of beauty and the seat of Federal government. It implies trust, pride and respect.

Whirlpool – A magical word in homemaking. Founded forty-eight years ago at St. Joseph, Michigan, this company is noted for integrity in personal and business relationships, the fine quality of its products, the superiority of its facilities, the excellence of its customer oriented programs of basic and applied research for industry and government.

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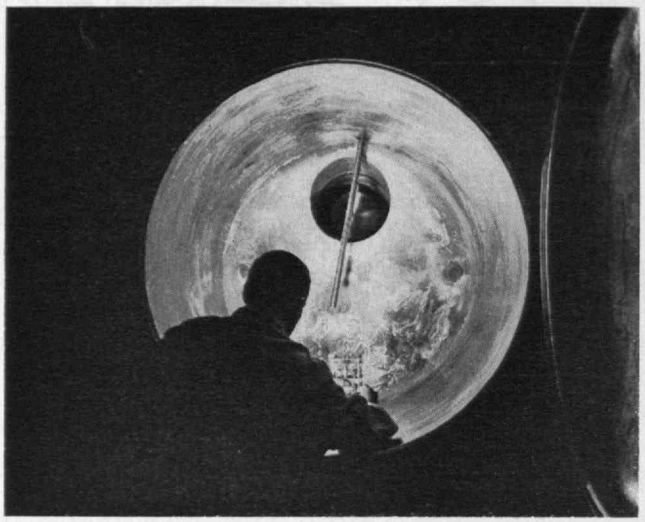
The Massachusetts Institute of Technology is exemplary of these attributes.

Testing Space Vehicles At Orbit Altitudes



New ultra-high vacuum chamber, believed to be the first large space test facility in the U. S. which can reproduce the extreme vacuum encountered by satellites at orbit altitudes in excess of 450 miles, has been announced by National Research Corporation, Cambridge, Mass. It has reached pressures as low as one ten-trillionth of the normal earth's atmosphere (8×10^{-10} millimeters of mercury) and will permit, for the first time, realistic testing of large space vehicle components. Operated for government and industrial laboratories on both a service and research basis, the facility can be modified to permit introduction of thermal radiation and can be adapted for performing emissivity and various mechanical tests under ultra-high vacuum.

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Russia's Challenge in the 1960's

(Continued from page 27)

rapid growth made it possible for the economy as a whole to continue to grow. These sectors have stimulated productivity in other sectors directly and indirectly; they set up new direct demands, such as the railway demand for coal, iron, and engineering products, and they also opened up wholly new avenues of economic development.

We are emerging from the process of diffusing a new level and pattern of consumption based on the automobile, electric-powered gadgets, etc. While that process proceeded, we collected powerful and general productivity benefits in a wide range of industries. The expansion in population and the increased demand for services will help to maintain full employment in the United States — but a lateral expansion of our facilities to accommodate a larger population, and increased outlays on education, travel, health, and so forth, are not likely to induce new technological revolutions with powerful and widespread secondary effects on the nation's productivity level.

We are not without resource. Science and technology are expanding at an unprecedented rate. We should beware, however, of global statistics. In research and development, results are proportionate to quality rather than to the scale. Concentration in both quality and scale of research in relatively few fields may not yield us the national result we would like to see. A great deal of contemporary research and development is directed to fields of military interest, from which the civilian economy benefits only in indirect and uncertain ways.

Bottlenecks and Staffing

It would be wholesome to place the issue of productivity high on the national agenda. It might be useful, for example, for task forces to examine the productivity potentials in various major sectors of the American economy, and do so with three objectives in mind:

1) To identify the specific technical and institutional bottlenecks which need to be overcome;

2) To see whether it might not be in the common interest to allocate increased research and development talent of the first order to older, less glamorous fields where deceleration or decline has set in, but where substantial proportions of the nation's resources are still consumed; and

3) To examine systematically the extent to which entrepreneurship in the various sectors is or is not effectively bringing to bear the potentials which already exist for increased productivity. Among the particular sectors that deserve close examination is what might broadly be called staff work both in government and in the private economy. We have carried over into staff work criteria of specialization derived from notions of scientific management which originated in the problems of running a railroad system, an army in peacetime, and a machine shop. This leads to overmanned, overfragmented staffs, with tremendous inertia built into them, consuming their

energies in maintaining the *status quo,* radically damping the pace of innovation.

History appears to have decreed that, in order to remain a front runner, we shall have to continue to pioneer — in this case to pioneer in engineering productivity increases along a broad front. And in facing this challenge we should not complain, for a front runner's status is never automatically sustained. It must be constantly renewed.

An Overriding Conclusion

Our experience in the past century and three quarters should convince us that the democratic process in the United States is tough, resilient, and capable of handling whatever problems the flow of history may place on our agenda.

Our dangers do not lie primarily in the size of the Soviet economy or its over-all rate of growth. Our dangers lie in a particular allocation of Soviet resources, in particular Soviet policies, in the way we Americans now conceive of our problems on the world scene, and consequently in the way we allocate our resources, human and material.

Between now and 1970 a decisive test will take place. There is nothing in the structure or growth rates of the two economies that will automatically determine the outcome. The answer lies in whether our political leadership mobilizes the evidently ample resources that lie to hand — the resources of will, of skill, of talent, of commitment to the American heritage, as well as of goods and services — to do the job.

Talk of Our Times

(Continued from page 20)

— men who become molders of opinion and public leaders who make a vital contribution to the common account, because they are, first of all, scientists and engineers and possess the insight and understanding of their specialties but who also have that broader scope which makes them effective in public life. There is a great shortage of men and women with adequate scientific understanding who can be and are willing to try to be effective in the political and policy-making arena.

We have many weaknesses to correct and many potentials to fulfill in American education but we also have great strength and great accomplishment to protect. As we examine our educational system to note where it fails to match the ideals we have set or where it needs to catch up with the rapid changes of our time, let us keep clearly in mind that our system is an American system evolved to serve the special needs and ideals of our free society. As we seek to strengthen it, let us keep foremost in our minds the importance of keeping our system focused on the needs and ideals of our society. We cannot import systems of education or copy the standards and aims of other nations. We grow stronger by meeting our own indigenous needs in our own indigenous ways, by surpassing ourselves rather than trying to surpass some other nation. By the same token the quality of our education depends upon the belief of the American people in education, upon their enthusiastic and unshakable conviction that no social activity is more important to us than education. The quality of our education rests upon the collective judgment of our citizens as to the relative importance of education in their scheme of things, upon your and my willingness to give increasing priority to the investment we make in men and ideas as we seek ever higher investments in things. Our values and attitudes are all-important. They must lead us to seek in every way we can to enhance the quality and taste of American life. I have confidence that, in the years ahead, the American people will be on the side of excellence, and that, educated in excellence, they will have the strength and adaptability to preserve freedom in a world of conflict and change.

The Visiting Committees' Work

Edward J. Hanley, '24, President of the Alumni Association, mentioned many ways in which Alumni assist M.I.T. when he spoke at last fall's Alumni Officers' Conference, and called particular attention to the services of the Visiting Committees. He said in part:

ONE of the important services a Visiting Committee performs is its work as an effective liaison between the department staff and the Corporation. Since the Visiting Committee periodically reviews and investigates the department's activities, and confers with the department head, members of the staff, and — on occasion — students, it can serve as a two-way street of communication between the Corporation and the

(Concluded on page 50)

Talk of Our Times

(Concluded from page 48)

department. Its subsequent reports to the Corporation are often important in policy making. During its discussions with departmental personnel the Visiting Committee often has an opportunity to bring into the department ideas, thoughts, and suggestions—both from the world of practical experience and from the Corporation.

The point of view and the needs of industry and the professions are carried directly into the department by members of the committees. . . .

When Visiting Committees perform these functions, and I am sure that all of M.I.T.'s 22 Visiting Committees do, they play a very important part in:

1) The *maintenance* of high educational standards;

2) The continual *adjustment* of M.I.T.'s educational program to new and changing conditions and to greater opportunities; and

3) The *formulation* of policy.

Many of the most important changes in M.I.T. policy have resulted from recommendations of Visiting Committees.

One example of the kind of contributions that Visiting Committees have made to the Institute is afforded by the Report of the Visiting Committee on the Department of Mining and Metallurgy in 1937.

After an intensive study of the curriculum, that Visiting Committee back there in 1937 recommended the establishment of a separate Department of Metallurgy. This move enlarged and intensified the Institute's work in this field. It also resulted, a year or so later, in a report recommending that the Institute withdraw from Mining and leave this subject to the western schools. . . .

This spring I reported to the Corporation for the Visiting Committee on the Department of Metallurgy in part as follows: "Still further broadening is taking place until even the appropriateness of the name 'Metallurgy' has been questioned as opposed to, say 'Materials Engineering.' Neither the Department nor the Visiting Committee is of one mind on this suggestion. There is some feeling, though, that 'Materials Engineering' might ultimately be the field of the bachelor's degree with further specialization in metallurgy in the Graduate School. No conclusions were reached in this discussion which has been active for at least three years."

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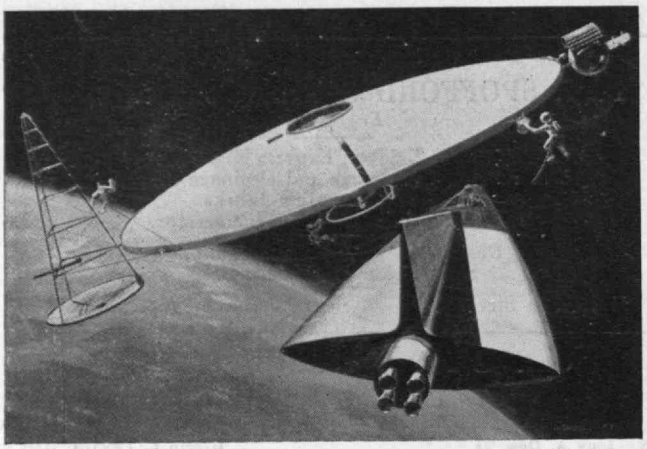
Space-age careers at Boeing



This year, engineering and science alumni will find more challenging and rewarding careers than ever at Boeing. Advanced missile and space-age programs are expanding, and the proportion of engineers and scientists to Boeing's total employment is growing steadily. Boeing programs include the Dyna-Soar boost-glide vehicle, Minuteman solid-propellant ICBM, BOMARC *defense missile system, B-52G missile bomber, KC-135 jet tanker-transport, the Boeing 707 jetliner, and lunar, orbital and interplanetary systems and advanced research projects. A few of the many immediate openings are listed below:*

ADVANCED CONFIGURATION DESIGN — **WICHITA AREA**

M.S. or Ph.D. in A.E. to create configuration of new vehicles proposed by potential military or civilian customers. Creative design of vehicles based on general parameters of missions (payload, performance, etc.). In addition to configuration, special features such as handling payload (i.e., cargo, passengers) and comparison with competitors' proposals are investigated.

INFRARED — **SEATTLE AREA**

Electrical engineer or physicist with advanced degree to set-up and direct an Infrared System Group involved in: (1) Studies and analyses of infrared systems, techniques and phenomena, (2) Definition of models and parametric relationships, and (3) Synthesis of advanced infrared sub-systems (search, track, terminal guidance, mapping, surveillance, and scientific instrumentation) for integration into larger systems.

ELECTRONICS-RELIABILITY — **SEATTLE AREA**

Electrical engineer with B.S. degree minimum (graduate work or equivalent experience desired) to organize and manage reliability programs; to establish requirements, evaluate reliability data and initiate corrective action for missile components and tactical test equipment.

ELECTRONICS-DIGITAL COMPUTER — **SEATTLE AREA**

Engineers with advanced E.E. degree or particularly applicable experience to design and integrate digital computers in advanced military and space programs, involving internal logic design of the computers and the external organization of the associated equipment used in the guidance and control system.

ENGINEERING ANALYSIS & PROGRAMMING — **SEATTLE**

Mathematicians or engineers with B.S. to Ph.D. degrees to work in engineering computing and analysis areas. Analysis positions involve correlation and conversion matrix studies, trajectory simulation programs, error analysis and simulation studies and many others. Computing positions involve programming a wide variety of complex engineering problems to be solved with high-speed electronic data processing machines—digital and analog.

PLASMA PHYSICS — **SEATTLE AREA**

Experimental physicist with Ph.D. in physics for the staff of the Plasma Physics Laboratory, Boeing Scientific Research Laboratories, to conduct studies in the field of Basic Experimental Micro Wave Plasma Physics, Basic Transport Properties of Plasmas and in Theoretical and Experimental Quantum Plasma Physics.

OPERATIONS & WEAPONS SYSTEMS ANALYSIS — **WICHITA**

M.S. or Ph.D. in math, physics, electrical or aeronautical engineering to obtain data on the anticipated operational environment of the devices under study by Advanced Design Staff. Devise analytical models of procedures describing operation of the devices in order to estimate the operational utility of same under study. Studies compare Advanced Design products with other companies and demonstrate anticipated utility to the customer.

ELECTRONICS-TELEMETRY — **SEATTLE AREA**

B.S.E.E. with good knowledge of telemetry systems, transducers, and systems providing inputs into telemetry systems, to work on telemetry systems integration. This requires ability to represent the company in meetings with the customers and associate contractors.

ELECTRO-MAGNETICS — **SEATTLE AREA**

Ph.D. in electrical engineering or physics to direct and participate in the work of a research group engaged in the theoretical and experimental investigation of the propagation and reflection of electro-magnetic waves in the presence of a plasma.

WELDING ENGINEERING — **SEATTLE AREA**

Engineers with degree in Met.E., Mech.E., E.E. or equivalent, to maintain weld equipment, design tools, develop techniques and direct proper use of this equipment, and establish processes for all types of welds used in the unit, including weld settings for qualification programs.

PERFORMANCE & STABILITY & CONTROL ANALYSIS — **SEATTLE AREA**

Aeronautical engineers at B.S. and M.S. level to conduct performance analysis and stability and control analysis. Each field is intimately associated with flight testing and wind tunnel testing. Performance assignments include preparation of sales presentations, operating instructions and preliminary design work in connection with new aircraft; stability and control assignments cover wing and tail design as well as studies concerning detailed control systems.

GEOASTROPHYSICS — **SEATTLE AREA**

Theoretical physicists or astronomers with Ph.D. in physics or astronomy on the staff of the Geoastrophysics Laboratory, Boeing Scientific Research Laboratories, to carry out theoretical research studies in the field of Geoastrophysics, particularly in connection with the phenomenology and physics of the planetary system. Excellent support is available for research in Solar Physics, Solar Terrestrial relationships and Upper Atmosphere Physics.

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For further information write: Mr. Stanley M. Little, Boeing Airplane Co., P. O. Box 3822 - UMT, Seattle 24, Wash.

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Club Notes

Miami Club Elects New Officers

The first meeting of the year on May 27, 1959, a luncheon at Betty's Restaurant in Miami, was highlighted by the election of the following as our new officers: President, Irving Steinhardt'48; Vice-presidents, Donald S. Whitmore'51, Frederick D. Rich'13, O. Whitmore Burtner'31; Treasurer, Scott J. Hoehn'47; and Secretary, David N. Leslie'54.

On June 30, 1959, the club met for dinner at the Garden Restaurant in Miami. The Alumni and guests attending were: Kenneth P. Armstrong'10, Harold A. Cook'58, Mr. and Mrs. Scott J. Hoehn'47, Mr. and Mrs. Edward I. Mandell'21, Thomas E. Mattson'24, and his guest, William Rebozo, Jr., Mr. and Mrs. Richard L. O'Donovan'27, John K. Jamieson '31, David N. Leslie'54, Mr. and Mrs. Frederick D. Rich'13, Frederick B. Philbrick'18, Irving Steinhardt'48, and his guest, Miss Elsa Loebman. A delicious meal was followed by colorful movies of scenic Costa Rica and bullfighting in Panama City.

If any Alumni are visiting our way, we would be pleased to hear from you. Just contact any of our officers and we shall be most happy to have you at our meetings or extend to you our welcome and hospitality. — DAVID N. LESLIE'54, *Secretary,* 758 Arthur Godfrey Road, Miami Beach, Fla.

Worcester Hears Rose On Thermonuclear Power

The first meeting of the 1959-60 season was a huge success. Held at the Franklin Manor, November 5, the meeting featured Dr. David J. Rose, Professor of Nuclear Engineering at M.I.T., and Volta Torrey, Editor of The Technology Review. Volta Torrey acted as moderator, asking questions of Dr. Rose which fully covered the subject, "Thermonuclear Power, Fact or Fancy."

This year the M.I.T. Club of Central Massachusetts is not only presenting a varied program of scientific and educational interest, but is attempting to promote a social atmosphere wherein old and/or new acquaintances may be renewed. A sponsored cocktail hour prior to each meeting has been planned for the 1959-1960 season.

The next meeting, to be held the first weekend in December, is going to be a social evening — ladies' night — at the Old Mill in Westminster. The executive committee has asked Oscar H. Horovitz'22 to bring some of his interesting films with him, as well as "The Social Beaver," the film on Institute life and student activities.

The second week in March, Professor Samuel A. Goldblith'40, is going to present "Food Technology." There have been huge strides made in this field in recent years, with the application of electronic measuring devices to sample the differences in texture of foods, in simulation of the human process of eating. This meeting, again a ladies' night, will be held in Worcester at either the Stockholm Restaurant, or the Hickory House.

The final meeting will be Tech night at the Pops. A block of tickets is being obtained for the evening that the Institute's student body will be at Symphony Hall. Dinner prior to the Pops will be served at the Faculty Club. — HARRY B. DUANE'57, *Secretary,* 15 Algonquin Road, Worcester 9, Mass.

Buffalo and Niagara Falls Give Dinner-Dance

The club opened its season with the traditional dinner-dance at the Youngstown Yacht Club, September 30, 1959. Bob Horrigan'44 and Tom Hooker'40 get credit for arranging a pleasant evening for some 60 members, wives, and guests.

Next on our schedule is a trip through the International Salt Company mine at Retsof, N.Y., on April 20, 1960. It is to be a daytime affair ending with a dinner. Chuck MacKinnon'39 is handling arrangements.

The annual meeting and election of club directors is planned for Thursday, May 19, 1960. We have been fortunate to obtain Professor C. Stark Draper'26, Chairman of the Department of Aeronautics and Astronautics, to address the membership at this meeting. Place and time will be announced at a later date.

The new officers as elected at the directors meeting in August are as follows: Robert V. Horrigan'44, President; Homer Fay, '53, Vice-president; and CHARLOTTE POTTER,'48, *Secretary-Treasurer.*

At Southern California's Board of Governors meeting are, from left to right: Bob Copsey'44, Vice-president; Hi Beebe '10, Bob Welles'15, Tony Thormin'27, Bob Kallejian'16, George Cunningham'27, Dick DeWolfe'36, President; Vic Stanley'44, Jim Cullison'41, Gary Loomis'44, Treasurer; Ray Stringfield'15, Vice-president; Joe Marshall'53, Secretary.

New Mexico Club Host To Chamberlain

Taking advantage of a visit to Albuquerque by Gene Chamberlain of the M.I.T. admissions office, the M.I.T. Club of New Mexico held a cocktail party and dinner on November 6. The scene was a charming adobe house called Casa DeLas Heurtas in the little town of Placitas nestled against the Scandia Mountains near Albuquerque. The club was also host to Richard Schleck, a candidate for admission to the graduate school at M.I.T., but presently attending the University of New Mexico.

We were very happy to have with us Mrs. F. J. Given and her sister-in-law, Mrs. Katharine Given, who is visiting her. This occasion was almost the first anniversary of the M.I.T. regional conference in Albuquerque which the recently deceased Mr. Given so very ably led. Other attendees at the dinner were: Mr. and Mrs. F. C. Alexander'32, Mr. and Mrs. B. L. Basore'52, Mr. and Mrs. L. Ehrman'53, Mr. and Mrs. J. E. Gross'50, Colonel and Mrs. W. S. Hutchinson, Jr. '49, Colonel and Mrs. L. A. Kiley'39, Mr. and Mrs. W. R. Perret'30, Mr. and Mrs. R. E. Quinlan'30, Mr. and Mrs. T. J. Raftery'31, Mr. G. E. Reis'50, and Tess Emree, Mr. and Mrs. W. A. Shinnick'50, and our president B. J. Weston'54 and his wife. Professor John Linsley of M.I.T. and his wife were also present. They are temporary residents of Albuquerque where Professor Linsley is in charge of a cosmic ray detection project. Several enterprising Alumni wrangled an invitation to visit the experimental site during the cocktail party. — J. E. Gross'50, *Secretary*, 1208 Florida N.E., Albuquerque, N.M.

New Hampshire Host To Severance and Weiss

The M.I.T. Club of New Hampshire held its fall meeting Thursday evening at the Nashua Country Club with a large attendance from all parts of the state. President Norman P. Randlett, of Laconia, was the toastmaster. The other officers of the club are: Vice-president, Glenn D. Jackson, Jr., of Amherst; Representative to the Alumni council, Lawrence C. Hall, of Amherst; and Secretary-Treasurer, Blaylock Atherton, of Nashua.

Following the dinner, Donald P. Severance, Secretary of the Alumni Association, gave an interesting discourse on recent activities at the Institute and compared them with affairs of the Institute's early years. Herbert G. Weiss'40, group leader of the special radar group at the Lincoln Laboratory, gave a talk entitled, "Keeping up to Date on Satellites." This was most interesting to the members present, who plied him with questions after the talk.

Members present at the dinner were: George Apel'26, R. Ellsworth Annis, Jr.'48, Louis A. Arnold'42, Blaylock Atherton'24, William T. Barker'35, Edward A. Beaupre'41, Jason T. Bickford'23, Elmer R. Burling'30, Ormonde C. Clishman'14, Salvatore R. Caso'48, F. Tenney Clough '38, Walter Davol'06, Charles M. Dierksmier'37, Thomas B. Drew'23, Vincent T. Elkind'42, Malcolm Gordon'46, Lawrence C. Hall'35, Sidney Hall'43, Russell B. Hawes'49, Paul F. Hayner'51, Glenn D. Jackson, Jr.'27, Thomas G. Kudzma'56, Leon W. LaBombard'41, Philip Labombarde'47, Sing Leong'45, Julian Lovejoy '22, Clarence L. Nutting'19, Harold W. Pope'39, Charles R. Prichard, Jr.'30, Neil F. Putnam'34, Norman P. Randlett'22, John P. Rich'29, William T. Rusch'52, Francis J. Safford'34, Richard E. Spifle'55, Davis P. Thurber'48, M. Arnold Wight, Jr.'40, Burton W. Williams'53, Renald Rivero'54, and Lawrence T. Kwan'53.— Blaylock Atherton'24, *Secretary-Treasurer*, 142 Main Street, Nashua, N. H.

Philadelphia Hears Talk On Atomic Submarines

Bill Hargens'41, arranged a fine fall meeting at the Franklin Institute on October 26. Following the usual warm-up social hour, we were addressed by Captain William H. Groverman, U.S. Navy, Directory, Anti-Submarine Warfare Division in the office of the Deputy Chief of Naval Operations, Research and Development. After a review of developments in the field of submarine warfare, with emphasis on the menace of the modern missle-carrying atomic submarine, we were privileged to view a movie of the trip of the Nautilus under the North Pole.

Our next meeting will be at the Barclay Hotel on Tuesday evening, January 26. We will be addressed by Professor Norman J. Padelford on the international situation. He is chairman of the Political Science Section at M.I.T. Our annual elections will be held on that date, too.

We have been notified of honors extended to two of our local Alumni. Joseph L. Gillson'21 has been made an Alumni member of the M.I.T. Corporation Visiting Committee for the Department of Earth Sciences. Pierre S. duPont, 3rd,'33 has been nominated for the Committee on Student Activity. — Herbert R. Moody'41, *Secretary*, 3010 Tower Road, Huntingdon Valley, Pa.

Lehigh Valley Club Visits Organ Company

The fall meeting of the M.I.T. Club of the Lehigh Valley took place on Tuesday, November 10, 1959, with 20 members participating. After a social period over cocktails, a dinner was enjoyed at the Village Inn located on the western outskirts of Allentown.

The group then drove about eight miles to visit the Allen Organ Company in Macungie, Pa., with some of the group getting lost temporarily due to detours caused by road construction. A brief meeting was held, and then an excellent lecture demonstration on organs in general, and electronic organs in particular, was given by one of the staff of the company. Many of us displayed our lack of understanding of organs and their operation by the myriad questions that were asked. A tour of the plant was also very interesting to the group, and we finally had to drag ourselves away because of the late hour. — J. T. Acker'24, *Secretary*, 154 W. Langhorne Avenue, Bethlehem, Pa.

Women's Association Hears Kennedy and Dean

The M.I.T. Women's Association met on Sunday, November 1, at the home of Mr. and Mrs. Robert C. Dean in Wellesley Hills. The members and guests gathered for a delicious buffet supper of chicken casserole, prepared by Mrs. Dean, and a variety of salads, prepared by other members. After supper our President, Frieda Cohen'45, welcomed our special guests, the Freshman women. She said that one of the aims of the Association is to help the women students at the Institute, with advice, money, or in any other way possible.

Mrs. Dean, the program chairman, then introduced the speakers of the evening, Mrs. Mary Morrison Kennedy, IV, '25 and Mr. Robert C. Dean, IV, '26. Their subject was "Architect-Decorator Collaboration." While showing colored slides of the new Sheraton Hotel in Portland, Ore., Mrs. Kennedy and Mr. Dean pointed out special features arrived at by close co-operation of architect and decorator. We were all greatly impressed by the colorful interiors and by the profusion of local art used in the hotel. — Anna Bailey'54, *Secretary*, 61 Columbia Street, Brookline, Mass.

Washington to Establish "Dames" Group

Plans for the establishment of a ladies group (Dames) to assist the M.I.T. Club of Washington have been announced and several organizational meetings have been held. Mrs. Jack Phillips is interim chairman until a slate of officers can be formally voted upon. There will be a meeting of all ladies interested, in January.

At a meeting of the executive committee held on November 12, plans for the forthcoming students' luncheon to be held on December 28 were discussed. This luncheon under the chairmanship of Robert W. Blake'41 is an annual affair to which M.I.T. students from the Washington area, who are home for the Christmas holidays, are invited, as well as prospective M.I.T. students. — Lt. J. G. Beebe-Center, Jr.'56, *Secretary*, 3516 Lowell Street, Washington, D.C.

Rochester's Educational Council Entertains Students

On November 2 the educational council associated with the M.I.T. Club of Rochester entertained about 50 high school students and their parents at the University Club. Dave Greenlaw'57, Dave Richardson'37, and Ray Grammer'47, spoke briefly about what engineers and scientists do. Hank Couch, Jr.'59, gave the students a description of campus life from the viewpoint of a recent graduate. Samuel Jones, assistant to the Director of Student Aid at M.I.T., presented something of the M.I.T. philosophy on education. Harry Essley'36 planned the meeting with the help of Fred Kolb'38, and Fred Tone'35 prepared a display of M.I.T. literature. — Arnold Mackintosh, Jr.'44, *Secretary*, 164 Glen Haven Road, Rochester 9, N. Y.

New York City Club In Full Swing

Several members of the club have made news recently. Richard Cheney'27 and Tom Creamer'40 were nominated to the M.I.T. Corporation Visiting Committee on Student Activity. Samuel Auchincloss '27 pointed out the urgent need to cut down radioactive waste disposal costs, effectively, at public hearings in Washington, D.C. Don Young'50 published an article in *Chemical Processing* on the security analyst's view of the chemical industry. Dave Fulton'37 was named vice-president of sales at the Chemical Construction Company, Division of Electric Bond and Share Company.

Club activities are in high gear now. The Westchester section, headed by Ed Goodridge'33 held a panel discussion on preparing high school sons and daughters for college, moderated by Dr. Robert Cotton'39. On November 15 the Long Island section staged their now famous Travel Dinner Meeting, led by John Casey'40. Major international airlines – KLM, Italian Line, VAT, EL, AL, and French Line – flew in foods directly from different countries of the world. On October 28 the first technical seminar, chairmanned by Gaby Garbarino'33, was held. Professor Bitter of the Physics Department spoke on "Magnetism." The panel of sponsors consisted of E. J. Gohr'26, Vice-president of Esso Research and Engineering Company; Dr. Clarence Zener, Director of Research of Westinghouse Electric Corporation; Dr. Murray Goodman of the Polytechnic Institute of Brooklyn; Dr. William Kelly of the American Institute of Physics; and T. C. Williams, President of Stone and Webster Engineering Corporation.

In other areas, several club members deserve applause for their combined efforts in increasing the value of the club to its members and visiting Alumni and Institute staff. Lars Ekwurzel'35 has done more than an outstanding job editing the eight page *Newsletter*. Lars and his staff: Gaby Garbarino'33, Ralph Krenkel'46, Wendyl Reis, Jr.'56, Sid Levine'37 and B. Hirsch are credited with a *Newsletter* which itself is worth joining the club to receive. Wick Eddy'26 and Al Bassett'26 have established another attractive club feature in recent years with the Tuesday night bridge party. Many new and familiar faces can be found in the club quarters every Tuesday night. John Casey '40 is spearheading a membership campaign aimed at the large number of non-club Alumni in the Greater New York area. Frances Karlan'42 is doing an excellent job as chairman of the monthly women's luncheon. Behind-the-scenes workers, who are helping in no small measure to make this year a success, include: Jerry Schooler'59, Dick Steuer'46, Howie Bollinger'43, John Hennessey, Jr. '51, and Ted Henning'46. Bob Murphy'28 is doing an excellent job co-ordinating all the class luncheon sponsors from before 1900 to the present date.

Coming up are more dinner meetings, undergraduate activities, and a number of other varied activities. More on these next month. – James M. Margolis'52, *Secretary*, 218 Richbell Road, Mamaroneck, N. Y.

Dandrow Presents Silver Stein To Glassett at New York Dinner

SCIENCE and engineering will be among the most powerful shapers of American society over the next century, Julius A. Stratton'23, President of M.I.T., said in an address delivered at the annual dinner of the New York M.I.T. Club on December 2 in the Hotel Biltmore.

The toastmaster, C. George Dandrow'22, of Bronxville, presented the Silver Stein Award to Alfred T. Glassett'20, of Bronxville. Mr. Glassett is a civil engineer and president of the W. J. Barney Corporation. Hosts for the dinner were Edward C. Edgar'35, of Chappaqua, President of the M.I.T. Club of New York, and A. Donald Green'26, of Westfield, N.J., President of the M.I.T. Club of Northern New Jersey.

"Never again," said Dr. Stratton, "can we consider science and engineering as disciplines remote from the major concerns of mankind. Henceforth, the course of science in the United States will be inextricably interwoven with our measures of defense and survival, the economic status of our citizens, and intimately related to every facet of our way of life . . .

"The history of our country is in large measure the history of magnificent engineering coupled with a genius for the management of great enterprises. Nothing that I can foresee leads me to believe that the role of the engineer will diminish in importance in the years ahead. On the contrary, as the forces of economic and political competition bear in upon us from all sides, the demands upon the American engineer will continue to grow, and his profession will become increasingly difficult and exacting."

Dr. Little Speaker At Baltimore

The M.I.T. Club of Baltimore held its fall meeting on October 14. We were pleased to have Dr. Elbert P. Little of Educational Services, Inc., as speaker. He told of M.I.T.'s role in improving the curricula in science education on the high school level. About a dozen of the invited guests were science teachers and principals from local high schools. It was a good meeting, and we are looking forward to our next one in February. – Jane S. R. Steiner '40, *Secretary*, 5219 Putney Way, Baltimore, Md.

Deceased

Richard E. Schmidt'87, October 17
Charles H. Warner'89, October 13
Lucy Walker'89, August 10
Charles C. Waterman'92, June, 1958
Arthur M. Worthington'92, November 11
Frederick M. Mann'94, October 28*
Frank E. Underwood'97, May, 1959*
Edward E. Albee'99, October 15*
Jedediah A. Morrill'99, July 5*
Roy G. Burnham'00, June 19*
Carl F. Suhr'00, September 23*
Oliver M. Davis'01, October 9*
Frank N. Emerson'01, June 4
Sumner Hazelwood'01, June 23*
William O. Kennard'01, October 24*
Louis S. Cates'02, October 29*
George E. Mather'02, October 20*
Robert Mayo, Jr.'02, August 20*
Gilbert H. Gleason'03, October 27*
Robert Livermore'03, September 26*
Walter Cronin'04, May, 1959*
Frank S. Farnham'04, October 15
Ralph H. Nesmith'05, October 22
Victor H. Paquet'05, September, 1959
William J. Cady'06, November 10*
Charles A. Merriam'06, July 15*
John G. Souther'06, March, 1959*
Henry B. Tourtellot'06, August, 1959*
Orrin W. Potter'07, October 17*
Albert F. Stevenson'07, May 27*
Lee S. Border'09, August, 1959
Thurston C. Merriman'09, August 16
Arthur W. Underhill'11, July 24*
Malcolm W. Leonard'13, October 12
Franklin C. Fette'14, June 27*
Dana H. N. Mayo'14, November 11
Francis O. Nelson'16, May 10
Douglas H. McLellan'17, July 8*
John Wentworth'17, June 20, 1958*
Irving G. Hall, Jr.'18, 1958*
Webb C. Patterson'19, October 5*
Edward L. Cochrane'20, November 14
Francis B. Culbertson'20, August 24
Alexander M. McMorran'21, October 20*
Colver P. Dyer'22, August 5*
Robert D. Estes'22, August 15*
Homer L. Ferguson, Jr.'22, July, 1959*
Philip C. Stevens'22, October 17
Nelson W. Burtt'23, September 4
J. Coleman Jones'23, October 10
Stanley W. Lovejoy'23, September 24*
Paul A. Jeanne'24, October 2*
Charles H. Leonard'24, no date given*
James B. Maxwell'24, May, 1959*
Thomas R. Montgomery'26, July 17*
John E. Nicholas'26, October 13*
Joseph F. Mulvey'28, June 5
Marvin J. Silberman'34, October 30
Peter J. Costello'39, October 7
Andrew A. Fogliano'39, June, 1959*
*Further information in Class Notes.

Class Notes

'91

The two letters which follow from Mrs. Robert Ball of 60 Storey's Way, Cambridge, England, are of real interest to those of us who have followed the distinguished career of our classmate Robert Ball.

"September 21, 1959—Life seems very empty without Robert. For the last 10 years all my time and energy had been centered around him. Now I have to readjust my outlook. I am greatly blessed in having my daughter and her much respected husband as part of my life. Though Kenya is far away, modern means of travel have greatly reduced the distance. My daughter's husband, Robert Ogle Baines, has been a pioneer in introducing soil conservation and terracing in the colony. He is chief engineer in the soil conservation department of the Colonial Agricultural Service in Kenya, and his word is final in all matters concerning his department. Their child, Robert Ogle Ball Baines, is being educated at Repton School, as his father was before him. Our other grandson, Robert Grant Ball, aged 19, represents the eighth Robert Ball in the family. He went to Marlborough College and for the last eight months has been in France learning the language and studying agriculture at the College of Agriculture at Grignon, seven miles from Versailles. In October he will enter Kings College, of which his great grandfather, father, and uncle were all members.

"The *London Times* of July 24 had a very nice notice of Robert S. Ball. We are following the visit of Mr. Kruschchev to your country with deep interest and hope it will result in a more favorable relationship."

"October 8, 1959—Robert would have been 90 on December 17 and I love to dwell on the thought of how happy he was in his old age. Up to the last, the magic word M.I.T. aroused his interest and nothing pleased him more than to be encouraged to recall his student days and his life in that increasingly famous institution. The visits to Cambridge, England, of M.I.T. professors were a delight to him and he much appreciated entertaining President Killian and his wife July 7, 1951, and Professor and Mrs. Keenan earlier in the year.

"Robert passed away peacefully on July 23. We had been married almost 56 years and our companionship had grown closer and closer. I received a letter from Professor Bake, the present professor of mechanical sciences here in Cambridge, England. He said: 'The department will always remember the important work he did for us in the pioneering days, when the department was being filled with distinguished teachers who set the standards towards which we still try to work.' The *Times* in its obituary notice said: As a teacher he was a pronounced success, having the faculty which he may well have inherited from his father, of arousing interest in the minds of the pupils. He also had a keen sense of humor which often enabled him to arrest the wandering attention of his students.'"—WILLIAM CHANNING BROWN, *Secretary*, 15 Forest Avenue, Hastings on Hudson, N.Y.

'92

The secretary has just been informed of the retirement of Sumner B. Ely as superintendent of the Pittsburgh Bureau of Smoke Prevention. Sumner graduated with us in Course II. I am indebted to the *Journal of American Society of Mechanical Engineers* for the following account of his career:

"Sumner Boyer Ely is now retired after a long career as an engineer and executive in the steel industry, as a professor of commercial, power, and mechanical engineering, and as a civil servant working for smoke abatement in the Pittsburgh, Pa., area. It was in this last calling, assumed after the conventional retiring age, that Professor Ely has achieved eminence. Because of age limitations, he became professor emeritus at Carnegie Institute of Technology in 1940. At that time he took a temporary position, which became permanent, as superintendent of the Pittsburgh Bureau of Smoke Prevention. He retired from that post in 1957 after having transformed the City of Pittsburgh from the 'Smoky City' to the 'Steel City.' His work made the Bureau a model for other cities, and his advice was sought by others working on the same problem both here and abroad. The Pittsburgh City Ordinance, prepared by the Bureau of Smoke Prevention, has been used as a pattern for similar regulations in cities throughout the United States. For 20 years prior to 1940, Professor Ely had been on the faculty of mechanical engineering at Carnegie Institute of Technology. While there, in addition to his regular teaching duties, he assumed responsibilities, in 1926 and 1928, as secretary of the first and second International Conference on Bituminous Coal; in 1930 he was vice-chairman of the third such conference. In 1936, Professor Ely was supervisor of sessions for the Third World Power Conference in Washington, D.C. As an engineer in industry he distinguished himself in executive posts with several steel companies. Professor Ely has written numerous papers published in *Mechanical Engineering, The Scientific Monthly,* and *Electric World.* He is the author of a book, *The Theory of Engine Balancing,* privately printed for use of students at Carnegie Tech. He has served American Society of Mechanical Engineers as a chairman of the Committee on Local Sections and as a member of the Fuels Division Executive Committee. He is a member also of a number of engineering societies, and was president of the Smoke Prevention Association in America in 1947 and re-elected in 1948. In 1956 he was named an honorary member of the Air Pollution Control Association. In 1955 he was named an honorary member of the National Association of Power Engineers. He is a past-chairman of the A.S.M.E., Pittsburgh Mechanical Section, as well as past-chairman of the Mechanical Section of the Engineer's Society of Western Pennsylvania. He is a registered professional engineer in the Commonwealth of Pennsylvania."—CHARLES E. FULLER, *Secretary,* P.O. Box 144, Wellesley 81, Mass.

Happy Birthday

Among the Alumni of M.I.T. now there are 3 centenarians, 79 nonogenarians, and 778 octogenarians. IDA M. CURTIS'96 will celebrate her 100th birthday on January 12 and A. PRESCOTT FOLWELL'88 his 95th on January 15.

Eighty-fifth birthdays will come for: JAY H. SABIN'02, January 5; RALPH C. HENRY'96, January 10; WALTER O. PENNELL'96, January 13; LOUIS J. RICHARDS'97, January 15; ELMER H. ROBINSON'96, January 25.

Eightieth birthdays will come for: DURWARD COPELAND'03, January 7; CHANDLER HOVEY'02, January 8; J. ALBERT ROBINSON'02, January 8; MARSHALL H. WASHBURN'03, January 15; RALPH H. PINKHAM'99, January 16; ALBERT E. LOMBARD'02, January 21; G. HUNTINGTON CLAPP'03, January 22; HARRY T. ROLLINS'04, January 22; LYMAN E. DODGE'01, January 24; LEWIS E. MOORE'02, January 24; LLOYD B. HAWORTH'02, January 25; WILLIAM WHIPPLE'01, January 27; WALTER SOHIER'03, January 30.

'94

A late September note from Charles G. Abbot referred most graciously to our recent class reunion, and brought the information that our honored President Horace Crary, who is still an ardent golfer, had recently made his *third* hole-in one. Those who have played with Horace in our numerous reunions in years past will not be surprised at his prowess. Horace and our late lamented Norwin Bean were always the top performers in those class tournaments, with Abbot generally a close third. Although now 87, both Abbot and Crary are playing regularly and both seem to be going strong, as Horace's recent feat indicates in his case. Possibly more important than this item, is Abbot's report that his "magnum opus," as he expresses it, the monumental study he has made during the past decade on long-period rainfall and weather forecasting, is now in the hands of the editor for publication. Ever since his retirement as secretary of the Smithsonian Institute, now many years ago, he has been a research associate at the Smithsonian, and has carried on what must be the most exhaustive study ever made on rainfall and weather. He has tried most assiduously to convince meteorologists and farmers, as well as others, of the accuracy and great value of his observations, and already some important farmers have reported most favorably. Meteorologists may be harder to convince, but they should

welcome the vast amount of statistical data that has been accumulated and it is most convincing to those who have studied the information which these studies have revealed. To us who know Abbot's capacity and sound learning, argument will not be necessary.

George Taylor is still active in buying, selling, and designing machinery, and he has also developed a most useful hobby in the rejuvenation of really old clocks. The secretary has learned by the grapevine route that George has done some remarkable things in this line, making by hand the parts which need to be replaced, especially wooden cogs and gears. This must be a most satisfying hobby, and we congratulate George on his skill and inventiveness. Having owned several grandfather clocks and numerous of lesser breed, the secretary wishes he had been similarly endowed.

It is with much sadness that we must report the death, since the time of our reunion, of one of our members, Frederick M. Mann, who died at Healdsburg, Calif., on October 28. After a very distinguished professional career as a practicing architect and as the head of the department of architecture at the University of Minnesota, Mann retired to the little town of Healdsburg in a charming part of California. We are fortunate that in the November Review a part of a letter from Mann could be given, and his devotion to M.I.T. made known. Now it is with deep sorrow, but also with pride in his accomplishments, that we must accept the inevitable. Mann had lived long and had acquired reputation and honors. He entered M.I.T. after having graduated from the University of Minnesota, and was with our Class the last two years, and then returned and secured his master's degree in 1895. He was a gentleman and a scholar in every respect, and a delightful companion. Having already graduated from Minnesota he was a year or two older than the class average. Unfortunately, the secretary cannot supply details as to his family, but if he is survived by widow or descendants, the warmest sympathy of his surviving classmates is extended to them.

After dilly-dallying all summer regarding a trip to Colorado Springs and the West Coast in search of some details of the history of the Refrigeration Research Foundation, the secretary took off in September for a three-week trip. His few days at Colorado Springs gave him much of the information he sought, but was especially notable because he ran into a snowstorm of major proportions, said to be the worst September snowstorm in local history. From Colorado he went to Santa Monica for a week and was welcomed by the P.K. Bates'26 family as a second 'dad.' He saw on television some of the World Series baseball games, and also had time to call on numerous friends and business associates (customers) of the family business, the Benjamin Chase Company, now managed by son Sam'33, at Derry, N. H. Then on to the Bay area, and a very fine visit with John C. Nowell, a classmate well known to all, at his lovely home in Hillsborough. It was a reunion long to be remembered, for Jack has been a friend since our Freshman year, and we had many memories and many friends in common. Jack and his wife, Sybil, were the most delightful of hosts, so this was a high spot in the ramblings of the secretary. So also was the stay with Hugh Griswold'29, another of the old students who seem to have accepted the secretary as a sort of foster father. Such visits are of deep significance to this old man. Before returning to Cambridge he was inducted into a group of the leaders in the Northern California Section of the Food Technologists known as the Old Guard in that area. This, too, was a heartening experience. Finally, a jet plane to Boston ended the three weeks of unalloyed pleasure and spiritual profit.—SAMUEL C. PRESCOTT, *Secretary*, Room 16–317, M.I.T.

'95

On June 20 Tom Wiggin, I, began his 87th year of an interesting life in engineering and otherwise. He has a family of five children, ten grandchildren and six great grandchildren. He is a consulting engineer mostly in Water Supply, Engineering Specifications Writing Committees. For over 30 years he was chairman of the American Standards Association Commission which has done research work and written the specifications under which practically all the cast iron water and gas pipes are made in the U. S. He has long been a member of the steel pipe and related committees of the American Water Works Association and chairman of the Spillway Committee. He served on several committees of the American Society of Civil Engineers and the American Society for Testing Materials.

For six years he worked on the Massachusetts Metropolitan Water System; two years on the new water supply for Pittsburgh as deputy chief engineer; one year in preliminary studies of New York City's water supply, then thirteen years as senior designing engineer of New York City's Catskill Supply, including many miles of deep pressure tunnels—pioneer construction. During World War I he was officer in charge of water and sewerage in France. Later he spent two years in China as engineer of studies for rehabilitation of the Grand Canal and in 1921 he went into private practice.

Lately he has been one of the consulting engineers to the Board of Water Supply of the City of New York. For recreation in recent years he has enjoyed walking one quarter-mile (one half-mile occasionally) nearly each day from about May 30 to October 15. Ice skating in winter and in the summer sailing his auxiliary sloop which, when not in use, is anchored during the yachting season about 200 feet from his front porch. This year he has had to quit the long distance swimming but not the other recreations.

Today, November 13, the last day to send class notes for the January, 1960, Technology Review, shows a membership in our '95's Eighty Plus Club of 23.

Since last January, 1959: Charles Adams, January 15; Gerard Matthes, April 8; Sam Maverick, May 24; Fred Richards, July 8; and Ed May, September 14, have gone ahead leaving us to carry on. All but eight of us have replied to our October 9 appeal to check our membership up to date. So if you are one of the eight, mail us your present address in the envelope we enclosed in ours of October 9, so we can give you better service and a correct January 1960 account.—LUTHER K. YODER, *Secretary;* A. D. F. *Assistant Secretary*.

'96

No Boston newspapers, except the *Christian Science Monitor;* due date Friday the 13th; not a single item of class news at hand. So I reread the last issue of The Review and found in the Candle Count four '96 men who have reached the age of 85 this fall. Going through the 71 membership cards we find 15 more who are or will be included on the list this year. In the same Candle Count the name of Joshua Crane'92 appears as a nonagenarian. Last night I saw the Boston Bruins lose a hockey game to Detroit. The game was played on an ice rink having a design of colored lines, circles, and round spots, and rules whose enforcement kept continually interrupting the game. It was an intricate development of hockey since the days Josh Crane played on Jamaica Pond with a six foot curved end hickory stick under one rule: "shinny on your own side."

Myron Pierce was one of the 15 unlisted 85'ers, so I called him up on the phone. He answered and asked: "What is it you want, money?" Incidentally he was the last contributor to the general fund. The answer was: "No, this is my sad day for I have not an item about '96." So I learned that he was still suffering from penicillin poisoning as he has been for a year, but still retains his law office and manages to get in town two or three times a week. Next month he and his wife leave for Towers Hotel, Miami, again, and both hope for the return of good health. He mentioned a friend he had in California who told him a few months ago that Hyde was not as active as he had been. You remember him as president at graduation. I didn't but looked it up and found that Myron's memory was correct. I had heard that Charley was ailing some time ago, so a few weeks ago I wrote him but have not received a reply yet. It almost seems possible that there should be some among those 71 members who would write to the secretary about their joys, sorrows, occupations, hobbies, travels, or usual routines, how they manage to get around if they can't walk or drive an auto (there seems to be some difficulty getting a license ever since President Lowell of Harvard had his revoked, not wholly on account of age but because of accidents he met with).—JAMES M. DRISCOLL, *Secretary*, 129 Walnut Street, Brookline, Mass.; HENRY R. HEDGE, *Assistant Secretary*, 105 Rockwood Street, Brookline, Mass.

'97

We have received word of the death last May of Frank E. Underwood, at San-

bornville, N. H. The Waterbury, Conn., *Republican,* reported at length on the career of James W. Smith who passed away in September as follows: "Mr. Smith was born in Lawrence, Mass., in October, 1874, and was graduated from the Massachusetts Institute of Technology in 1897. He was an instructor at M.I.T. the next four years.

"After this Mr. Smith was employed by the American Steel and Wire Company, first at its Worcester, Mass., plant, then in Trenton, N. J., and later as assistant manager of the firm's Pittsburgh, Pa., district. After service with the Wyman Gordon Company for two years, he was associated with the Gray-Davis Company munitions plant in Cambridge, Mass., during World War I and the early postwar years. Joining the Torrington Company in 1922, he remained there until 1947 when he retired as superintendent of the firm's Standard plant.

"Mr. Smith was a charter member of the Litchfield Board of Finance and board chairman for 14 years. A Litchfield Borough burgess from 1924 to 1953, he served as senior burgess the last 15 years of his tenure. He headed the borough board committee which in 1931 directed extensive repairs to the sewer system.

"During World War II and thereafter until his death, Mr. Smith was chairman of the Selective Service Board for this district. When young men left Torrington by bus or train for military duty, Mr. Smith usually headed the committee which bade them farewell. A 32nd degree Mason, Mr. Smith was affiliated with Aleppo Temple in Boston and a Newark, N. J., temple. He was formerly a member of the Litchfield Men's Forum and the Litchfield County University Club. His marriage to Ruth Vaught of Worcester, Mass., took place in 1916. She survives him."

We have heard from E. Percy Brown, III, that he has moved from Wolfville to Kingston, Nova Scotia. We quote from his letter: "I never was much of a class member, as I came in on my diploma from the Royal Military College of Kingston, Ontario, where I had majored in chemistry, math, and physics. It was not the same as if I had gone through the struggles of the Freshman year. I always felt that I owed Professor Robert H. Richards, head of Course III, a great deal. He was with me out in northern Michigan during summer school in 1896 when I met with an accident that nearly finished me. I did fight off the effects for 15 years, but had to give up mining. After that I went on a small farm, raising apples and small fruits, which proved very helpful physically. I led a very happy life, was happily married and was able to put my four children through college. By the way, my oldest boy is now located in Columbus, Ohio, and is state director of aviation." — AUGUSTUS C. LAMB, *Secretary,* 61 Hillcrest Place, Amherst, Mass.

'98

Happy New Year to all. During the absence of our secretary, his assistant has been asked to take over for the January and February, 1960, issues of The Review.

Ed will spend the months of November and December, '59, visiting his daughter, Mrs. Holden Furber, at Delchester Road, Gradyville, Pa., a suburb of Philadelphia. He intends to keep active outdoors, taking hikes in the woods, and so forth, and when he returns, we expect he will be one of our most vigorous classmates. His headquarters after January 1 until about the middle of May, will be at the Hotel Vendome, Boston.

Among some of the notes that Ed has left with me, is a clipping dated April, 1959, recording the purchase by the Babson Institute of Business Administration, of a small oil on copper portrait of Sir Isaac Newton, which is a copy of the famous Newton portrait painted by Sir Godfrey Kneller in 1702, depicting Newton at the age of 59. It is presumed that this copy, the only one of its genre in America, was painted by a contemporary of Kneller. The original now hangs in the National Portrait Gallery in London. This will be a valuable addition to Roger's Newton collection.

We note from another clipping received by Ed, that Captain and Mrs. Fred B. Dawes observed their 60th wedding anniversary on June 23, 1959. Fred has spent his entire life since his marriage with his family in Hudson, Mass., where he has been engaged as an electrical contractor and where he still maintains an electrical appliance store on Main Street in Hudson.

Our classmate, Ernest A. Bragg, who has lived most of his life in Milford and Holliston, Mass., sent us, in November, 1958, a 27-page booklet compiled by him and entitled "History of Braggville Section of Holliston, Medway, and Milford" published in 1958. We learn that Ernest's great-grandfather came to Milford in 1795 where he established probably the earliest industry in this country for the wholesale manufacture of boots and shoes. Also from Ernest, we have just received an 80-page booklet of "Poetry and Prose" published by him in 1959. The philosophy expressed in some of his prose is serious but sometimes, as he says, humorous and sarcastic. It reflects old-fashioned honesty and the sturdy environment in which Ernest was raised. He regrets that such truth and honesty are too infrequently encountered in the present business world. These characteristics are vividly expressed in his 18-verse poem "The Old Stone Wall." Such walls are still much in evidence in the fields and woods of New England. Ernest still keeps active and we congratulate him on his 90th birthday which he celebrated with his family in Milford on October 25, 1959.

It is always helpful to receive personal or other pertinent material which will provide interesting and informative reading for our classmates. — EDWARD S. CHAPIN, *Secretary,* Hotel Vendome, 160 Commonwealth Avenue, Boston, Mass.; FREDERIC A. JONES, *Assistant Secretary,* 286 Chestnut Hill Avenue, Brighton 35, Mass.

'99

Word has been received of the death of Jedidiah A. Morrill of Rochester, N.H., on July 5. He graduated from Boston University in 1896 and then took special courses at Tech.

According to a notice in the *Boston Herald,* Edward E. Albee of Winthrop, Mass., died on October 15. Ned was one of a group of Tech men who lived in the western division of the Boston and Maine Railroad. Your secretary also commuted to Boston on the same train during his student days and then walked up Beacon Hill and over the Boston Common to M.I.T. The subway was then in the process of being built and we made better time and got our exercise by hot footing it. Ned lived in Melrose then, as I did, so I got to know him well.

Gardner Barry suffered a partial stroke about the third week in October and passed away in November. Gardner and his sister were among those who attended our 60th reunion. He formerly lived in Melrose and was one of the commuting gang mentioned above. Gardner was formerly a civil engineer on the Cape Cod Canal. — BURT R. RICKARDS, *Secretary,* 349 West Emerson Street, Melrose 76, Mass.; PERCY W. WITHERELL, *Assistant Secretary,* 84 Prince Street, Jamaica Plain, Mass.

'00

Roy G. Burnham died on June 19, 1959. After graduating with us from Course II he held various positions with Lockwood-Greene Company, Pennsylvania Steel Company, Library Bureau and others. In 1902 he joined the teaching staff of M.I.T. as assistant professor in Mechanical Engineering, and remained at the Institute the rest of his working life. In 1935 he became instructor in Graphics which position he held until 1944 when he retired as Professor Emeritus. He lived in Essex, Mass., all his life and never married.

Carl F. Suhr, who was also a graduate of M.I.T. in 1900 from Course II, died September 13, 1959. Our information about Carl since graduation is very meager. He was a draftsman with Ansonia Brass and Copper Company, Ansonia, Conn., from 1901 to 1902, and assistant to the master mechanic of Ansonia from 1903 to 1906. In 1906 he went with the American Brass Company, Waterbury, Conn., as draftsman, becoming engineer in charge of the power division in 1907. He apparently remained in this position until 1946 when he retired. He was still living in Waterbury at the time of his death. He left a son, Frederick G. Suhr'31, who is also with the American Brass Company, Waterbury, Conn. — ELBERT G. ALLEN, *Secretary,* 11 Richfield Road, West Newton, Mass.

'01

I have first to report the death of three classmates. The Alumni Office has notified me of the passing of Sumner Hazelwood, II, of Hancock Point, Maine. He had been retired for some time but I have no further information concerning him. Professor Carle Hayward'04, has sent me a letter which he received from Frank Davis, a

classmate of his, telling of the death of his brother, Oliver M. Davis, XIII,'01, at Melbourne, Fla., on October 9, 1959, after a three months' illness with stomach cancer. He had a varied career and retired about 15 years ago. He was in his 80th year. Dave Cowell has just sent me a clipping from a Lake Wales, Fla., paper giving the death of William O. Kennard, VI, in his 81st year. He passed away at his residence on October 24 after a long illness. He was a retired teacher and went to Florida seven years ago from Eliot, Maine. He belonged to the Congregational Church and to Lodge 184 AF and AM in Eliot. He is survived by his wife, Mrs. Lula Kennard of Lake Wales.

Bob Derby, I, reported last May from Williamstown that he had been on a cruise around the world visiting New Zealand, Australia, Singapore, Ceylon, Aden and Suez, Marseilles, France, Gibraltar, and London. There is not much on this mundane sphere that Bob has not seen.

Dave Cowell, VI, from Hingham, Mass., wrote in May: "Had my 81st birthday in January. My knees bother me a great deal so I don't steam around far from home. I have several hobbies that keep me busy — correspondence with the two families in service, one in Germany and one in Florida; railroadiana from 1900 back to 1890; and answering genealogical information for the present generation of the various branches of the family. So I keep going."

Charlie Tufts, X, says that his winter trip was unusually prolonged as his wife suffered a bad fall which necessitated her going to a hospital.

There will be no class notes in February as the class letter is due to appear at that time. — THEODORE H. TAFT, *Secretary*, Box 124, Jaffrey, N. H.

'02

I have to record the death of three of our classmates: Robert Mayo, Jr., August 20; George E. Mather, October 20; and Louis S. Cates, October 29.

Mayo died in Washington, D.C., where he had long made his residence, as most of his professional career was as a heating and ventilating engineer in governmental departments. For a year and a half he was in the supervising architect's office, Treasury Department, as an engineering and mechanical draftsman and then for five years was a heating and mechanical engineer in the construction and repair branch of the quartermaster general's office, War Department. He resigned from this position to take one in the chief mechanical and electrical engineer's office, supervising architect, Treasury Department, where the work was along the same lines.

Mather died in Ocala, Fla., where he had retired after a busy life. He had intended, when he first left M.I.T., to go into municipal engineering but decided he did not care for its political atmosphere and instead went with the Western Electric Company. In 1913 he became chief engineer for the Puerto Rico Telephone Company and remained there for two years. Finding the climate detrimental to the health of his family, he left Puerto Rico and leased a farm with stock and tools in his native Vermont and began farming. In 1916 he returned to Western Electric and in 1920 was sent to the Far East to straighten out some difficulties in the operation of telephone equipment in Singapore and Calcutta. Later he was connected with the development of sound-movies and worked for a few years standardizing the sound recording system and apparatus. Upon retirement he settled down in Florida. He is survived by his wife, son, and several grandchildren.

The following is from the *New York Times* of October 30, 1959: "Louis Shattuck Cates, Chairman of the Phelps Dodge Corporation, leading copper producers, died late last night at St. Lukes Hospital. He was 77 years old. Mr. Cates, one of the great figures of American copper mining and refining, lived at 950 Fifth Avenue. He had been at work until a few days ago. He was born in Boston and received a degree in mining engineering at Massachusetts Institute of Technology in 1902. Eager to see action in the mining field, he became a time-keeper for the old Boston Consolidated Mining Company's mine at Bingham, Utah. Mr. Cates rose rapidly in his field, holding consecutively the posts of foreman, mine-shaft boss, superintendent of mines and, in 1910, general manager of the company. The same year, Boston Consolidated was absorbed by the Utah Copper Company, and Mr. Cates was made general engineer of the mines. About this time he was sent to Arizona by Daniel C. Jackling, vice-president and general manager of Utah Copper, to reorganize the operating staff of the Ray Consolidated Mine. He expected to be in Arizona a few weeks but remained there for nine years. In 1913 he became general manager of Ray, and six years later he returned to Bingham as general manager of Utah Copper.

"Mr. Cates was credited with having been the first engineer to introduce the undercut block caving method of copper mining on a large scale. He borrowed the idea from the methods used in South African diamond mines. During his tenure with Utah Copper the open-cut operations were electrified and concentration plants remodeled to give a daily capacity of 75,000 tons of ore, making the company one of the largest ore producers of the period. President of Phelps Dodge from 1930 to 1947, and chairman since then, Mr. Cates played a leading role in its development into one of the world's major producers of copper and copper products. In the years after 1930, Phelps Dodge acquired various copper properties. One of the largest transactions, which Mr. Cates directed, was the opening and equipping of the Morenci open-pit property in Arizona, a $40,000,000 operation.

"In 1938 he was elected the William L. Saunders Gold Medalist of the American Institute of Mining and Metallurgical Engineers in a ceremony at the Engineering Societies Building in New York. Many other honors, foreign and domestic, were also conferred upon Mr. Cates. He leaves his wife, Mrs. Ethel Cates; a daughter, Mrs. Norbert A. Bogden; three grandchildren, and a great-grandchild."

McKechnie, who has seriously taken up the study of botany, in a brief note written last October, writes: "Thanks for the letter of October 1. Now and then I like to think over the years we spent at M.I.T. I am comfortably situated here (Carlsbad, N.M.), enjoying the climate which is well suited to my age. I don't take as many pictures as I used to but still enjoy field trips looking for rare plants. I hope to make a trip to Boston next summer as I still have relatives there and may be able to see you again." Miss Lydia Weld, in a letter to Dan Patch, says she is enjoying living in San Francisco where she has many friends. From where she lives she has a beautiful view of the Bay and looks down on the Golden Gate. With binoculars she can see the ships as they come in and identify them by the funnel markings. She still follows her hobby — stamp collecting. John Marvin wrote that he was looking forward to taking the American Express luxury tour of South America on the S.S. Rotterdam leaving New York, December 11. The itinerary calls for a stop at Havana, thence through the Canal, down the West Coast with Christmas at the Juan Fernandez Islands; then around the Cape, up the East Coast to arrive in New York, January 29. — BURTON G. PHILBRICK, *Secretary*, 18 Ocean Avenue, Salem, Mass.

'03

Robert Livermore, 83, of Boxford, Mass., died in the Phillips House, Boston, September 26, 1959. He was vice-president of North American Mines, Inc., a company which he founded, and also former vice-president and director of the Calumet and Hecla Copper Company. Born in Dorchester, he was a graduate of both Harvard ('00) and Tech ('03), having prepared at Hopkinson's School in Boston. Following graduation from M.I.T., he took part in mining explorations in Colorado and Nevada, in the early period of mining on muleback and horse and wagon. Later, he directed a mining company in Ontario and then entered the steamship business in New York with William R. Randall and Company.

In World War I, he served as a captain in the Army Engineer Corps. Following the war, he returned to the shipping and steamship industry and then to mining. An officer and director of several mining concerns in later years, he served privately as a consulting engineer to many mining companies. He wrote several articles for technical publications. He was a member of the Somerset Club, American Institute of Mining Engineers and the Harvard Club of New York. He leaves his wife, Mrs. Gwendolen (Young) Livermore; a sister, Mrs. Livermore Wells of Boston; a son, Robert, Jr., of Beverly; two daughters, Mrs. Cecily Beal of Freeport, Maine, and Mrs. Gwendolen Woodward of Medfield; and 13 grandchildren.

The Class has lost one of its most enthusiastic members with the death of Gilbert H. Gleason, 78, at Winter Park, Fla., October 27, 1959. He attended the Boston public schools, the Roxbury Latin School, and entered M.I.T. in the fall of 1899. He was a member of the '03 football and track teams and was elected assistant manager of the varsity track team in his

Sophomore year, becoming manager the next year. He also took part in college plays—"The Grand Duke" and "The Medicine Man." He was assistant class secretary under Chester Aldrich from 1923 to 1926. At the end of his Junior year he left Tech to start a new testing department for the Boston elevated railway. Six months later, he went to work for the Green Fuel Economizer Company, selling equipment for recovering waste heat in boiler plants. He was for a time vice-president of the Dexter Engineering Company of Providence, R.I. Then he spent several years with the Dodge Manufacturing Company, installing power transmission equipment in textile mills. In 1916 he was a member of the first troop, Massachusetts state cavalry, and in 1917 enlisted in the field artillery of the regular army. Soon after his return to Boston, he started designing and selling "Process Machinery." A serious operation and a long period of hospitalization forced his retirement from active business in 1941. In 1932 at the winter olympics he was assistant coach of the U. S. hockey team, which only missed the olympic championship by one goal.

On November 23, 1903, he married Celia M. Baker of Boston. They had one son, Dr. Anthony Howe Gleason, and two grandchildren, Audrey Louise and Gilbert Howe Gleason, 3rd, all of whom survive him. In 1949 they moved from Boston to Summit, N.J., to be near their children. He was a Mason and belonged to the University Club of Boston, the Charles River Country Club and the Brae Burn Country Club; the American Society of Heating and Ventilating Engineers and the American Society of Mechanical Engineers. He was also a member of the Sons of the American Revolution, his great-great-grandfather having been a Minute Man at the battle of Lexington and Concord.—LeRoy B. Gould, *Secretary*, 36 Oxford Road, Newton Center 59, Mass.; Augustus H. Eustis, *Treasurer*, 131 State Street, Boston, Mass.

'04

The Review office has ordered class notes to be submitted on Friday the 13th (November). That sounds unlucky so we will be careful what we write. That won't be difficult for there is very little news. A note from Frank Davis indicates that he went fishing at his camp in northern Michigan and caught a cold. Hope he had better luck on his hunting trip. He also reported the death of his brother, Class of 1901.

Mrs. McCormick (Katherine Dexter) started her fall activities by attending the first meeting of the Back Bay (Boston) Neighborhood Association. This group is trying hard to keep this section of Boston from deteriorating too fast.

A combination of cold weather and the efforts of our treasurer has solved the great wasp problem reported in our December notes.

New Year's day will be past history when you read this but we hope you made a resolution to send some items of interest for use in later editions.

The last two months have been free from obituaries and we had hoped to make it three in a row but Gus Bouscaren has passed along a note received from Walter Cronin, Jr., reporting the death of his father last May. Walter was a popular member of our Class in student days and many will note his passing with sorrow.—Carle R. Hayward, *Secretary*, M.I.T., Room 35-304; Eugene H. Russel, Jr., *Treasurer*, 82 Devonshire Street, Boston, Mass.

'06

Among the letters received last fall was one from Jim Wick, II, who keeps coming back to Rockport during spring and summer. In fact, he is so fond of the place that he has bought another house, in Pigeon Cove he says, because he wants his children's children "exposed to that charming spot where they can swim, know fine people and be near dear old Boston—so next summer drop in," at 6 Holbrook Court off King Street. Marion and I like Cape Ann, too, and spend a day there now and then.

From the deep south came a letter from Terrell Bartlett, I, via Tom Hinckley. Terrell says in part: "I have the usual amount of work in my engineering office with emphasis on storm sewer programs and a new bridge over one of the new government flood channels here. As to other activities, I enclose a bulletin from our Kiwanis Club, which should certify to the boys that I am not getting old." It seems that T was bowling and his first ball got all but the 10 pin, but by mistake the pins were set up before he could go after the 10. So they went into conference and decided that if his first ball got the 10 they would call it a spare. Believe it or not, before his first ball slid into the gutter it nicked the 10 and brought it down, leaving all the rest standing. They agreed there was one chance in a thousand of doing that and awarded T "the fur-lined chapeaux."

Guy Ruggles, III, joined the ranks of the retired as of January 1, 1959, but says it took him till June to wind up everything in Cananea, Mexico, then spent the summer in Bisbee, Tucson, Nogales, and Phoenix, where he has holed in at 2334 North 29th Place. Drop in when you are on tour and if Guy isn't home you may find him with Harold Plummer, III, whom he sees quite often. A long letter from A. B. Sherman, VI, in October was mostly personal and Louis Tripp wrote early in November that he had succumbed to my "moving appeal of October 1" (a P.S. on his Fund letter) and sent along his contribution to help toward the 100 percent participation of the Class. Louis is living in retirement at 202 Hix Bridge Road, Westport, Mass., after many years in responsible engineering positions in several federal agencies in Washington, D.C.

As a result of that first Fund letter, our class agent was notified by Miss Marguerite Souther of the death in March of John Glendon Souther, II, probably in Jamaica Plain where he was born December 14, 1880. He prepared at that venerable old school, Roxbury Latin, got his degree at Harvard in 1903, then joined our Class Sophomore year as a graduate student. Although he took the three years in Mechanical Engineering, his love was evidently mining as his thesis was on "Black Sands from Gold Placers." We have no record for the first few years but by or before 1913 he was superintendent of the Artique Mining and Dredging Company, Quildo, Colombia, and until the early Twenties was with the Cia Minera Choro Pacifico Antigoya at Buenaventura, Colombia. After an interval at home, he joined General Foods in 1930 as experimental engineer in the Birdseye Division in Gloucester, where he continued until his retirement. His address had seemed to alternate between Jamaica Plain and Alameda, Calif., since 1937.

From his widow, the Alumni Office received notice that Henry Bernon Tourtellot, V, died in August 1959. He was a graduate of Williams College and was a graduate student with us Senior year only. For some years, until the early Thirties, he was with the American Can Company in south Boston, then until the late Forties was assistant to the general manager of sales in the New York office. His recent address since 1948 had been Stamford, Conn.

The Alumni Fund letters seem to be a means of getting information about classmates who have passed on. Sherm Chase received a note from Mrs. Merriam early in October. Charles Allen Merriam, II, died July 15, 1959, at Laguna Beach, Calif. He was born June 15, 1879, in Philadelphia and may have attended college before joining us Sophomore year as a special student. He was a member of the Mechanical Engineering Society and his thesis was concerned with "Investigating the Stresses in Locomotive Connecting Rods." After graduating, Charles went West and for a few years was engineer with a company in Portland, Ore., then by 1915 was structural engineer with an architectural firm there. Later he became superintendent of construction and finally a partner in the firm of Doyle and Merriam in Seattle in 1919, after serving in World War I as captain of engineers. He trained at Camp Lee, Va., and was in the construction division until January, 1919, in charge of field work during construction of the Tullytown (Pa.) Bag Loading plant. Charles was a charter member of the American Legion in Seattle and his firm was active for many years, doing work for numerous banks throughout the state. He retired around 1945 to Laguna Beach.

A few days after the above notes were completed came a letter from Bob Cushman: "I regret that this letter conveys sad news. Our Oregon M.I.T. Club has as you know listed four active and loyal 1906 men for many years. On November 10 this foursome was broken. Bill Cady passed on to the higher life. Bill will be deeply missed by our '06 contingent, by the other club members, and by his many friends here in Portland. Mrs. Cady demonstrated courage, faith, and a spiritual understanding throughout the drawn out illness." Bob explained that there were no news clippings available because of a newspaper strike—we know what a trial that kind of a strike can be as Boston printers were out for over a week! However, a year ago I sent Bill an abstract of

his career compiled from the usual sources, which he returned with additions and comments.

William James Cady, VI, was born February 12, 1885, in Ann Arbor, Mich. He prepared for M.I.T. at Chicago Manual Training School and Mechanics Arts High School, Boston. He was unique in one respect as the '04 *Technique* lists him as "VI 1st yr. S"—one of the few Freshmen who were listed with a course. Bill was a cute girl as a maid of honor in the 1903 show "A Scientific King" and was one of nine men who played the mandolin in "Simon Pure Brass" the following year. He was in the Mandolin Club all four years, being manager 1904–1905, was a member of the executive committee of M.A.H.S. Club, and of the Electrical Engineering Society. His thesis was on "High Frequency Voltage Measurements."

Soon after graduating Bill joined the Holophane Glass Company in New York City. It was there that I began my long friendship with him in 1908, when I accepted V. R. Lansingh's invitation to get into the fast-growing field of illuminating engineering with the Holophane Sales Company. Together, we moved out to Newark, Ohio, in 1910 when an engineering department building was erected for design, test, training, specification, and so forth, in that field. Bill was in charge of all photometric testing—and he solved a lot of problems! We parted company in 1913 when Marion, whom I had taken out to Newark as a bride in 1911, and I moved to East Cleveland and Bill went west to manage a large apple orchard at Hood River, Ore., owned I believe, by an uncle. That kept him busy until 1925—he related how one winter snow slid down the mountains, and buried a number of cars on the Columbia River Highway, where they stayed until uncovered by the spring thaw! From 1925 to 1953 he was head of the sales office division, Portland Gas and Coke Company. After retiring he had been associated on a part-time basis with a Portland firm, Hess and McFaul, dealing in investment securities. Otherwise, Bill had kept busy with golf, gardening, long auto trips, club, and other meetings. In 1917 he married Nellie G. Hewitt of Indianapolis, who has our deep and sincere sympathy in her great loss.

Howard Leslie Ober VI has moved from Monterey to Pacific Grove, Calif., Box 539, and Carroll A. Farwell, I, has asked the Alumni Office to change his address to 67 Glendale Road, Sharon, Mass. I had talked by phone with Carroll to ask him if the change meant that he had retired but he said he was only semi-tired, as he still goes into Boston now and then, being consultant to, and director of, Fay, Spofford and Thorndike. The Farwells spend several months at Chatham on the Cape every summer. How do *you* spend your summers—and winters?—E. B. Rowe, *Secretary-Treasurer,* 11 Cushing Road, Wellesley Hills 81, Mass.

'07

On Friday evening, November 6, 1959, the fall dinner of the '07 group was held at the Faculty Club at 6:30 P.M. with the following men present: Dick Ashenden, Henry Martin, Tom Gould, Bob Rand, Don Robbins, Gilbert Small, Phil Walker, and Harold Farrington. This is the first time that Harold has been able to attend any of our class functions for some time, and we had a very enjoyable evening, listening to his account of how gas and oil wells are drilled and the product distributed. He also spoke at quite some length on the financial problems involved. Your secretary reported on various class activities and answered questions from the men as to what our classmates were doing. Excerpts of this report are below:

On November 4, your secretary received a letter from Mrs. Ruth D. Stevenson, 79 North Main Street, Wolfeboro, N. H., notifying me that Albert F. Stevenson, whom we all knew as "Steve" when he was with us in Course VII, had died on May 27, Those of the men who were at the 50th reunion will recall that Steve attended, but apparently none of us knew that he was taken ill the last day of our reunion, and from that illness never fully recovered. He was quite a golf and camera enthusiast and pursued both of these hobbies at both our 45th and 50th reunions.

Don Robbins received a note on October 22, which he passed along to me, saying that Orrin W. Potter died last October 13. He was a Course I man and owned the E/L Ranch in Greenough, Mont. We have had practically no correspondence from him and your secretary did not find that he was included in our '07 portfolio. As is customary, I have written to his widow.

The Alumni Register notified me of the change of address of Frederic G. Coburn to Pilgrim Road, Marshfield, Mass. If any of the men can give me any further information about Fred, I would be glad to receive it. He was registered in XIII-A.

They also notified me that Charles M. Luce, 245 Cottage Road, South Portland, Maine, had died on December 17, 1957, and stated that he was connected with '07. There is no information in the secretary's records relative to this classmate. — Phil Walker, *Secretary and Treasurer,* 18 Summit Street, Whitinsville, Mass.; Gardner S. Gould, *Assistant Secretary,* 409 Highland Street, Newtonville 60, Mass.

'08

The first dinner meeting of the 1959–1960 season was held at the M.I.T. Faculty Club, Cambridge, Mass., on Wednesday, November 4, 1959, at 6 P.M. Bunny Ames, Bill Booth, Vick Carter, Fred Cole, Leslie Ellis, George Freethy, Sam Hatch, Henry Sewell and Joe Wattles were there with Mesdames Ames, Ellis, Freethy, Hatch, Sewell and Wattles as our guests. As usual we gathered in the cocktail lounge, and were lucky to capture three tables and enough chairs to take care of our crowd. While enjoying our favorite appetizers, and the delicious cheeses and crackers from the buffet, we learned of the various summer activities of our group and their plans for the fall and winter.

Myron Davis and his wife were on their way for a winter at St. Petersburg. The Hatches had recently returned from a visit with one of their sons in Cincinnati. About 6:30 P.M. we adjourned to private dining room No. 1 and decided what we wanted to eat. The food and service was just as fine as usual. After dinner the question of a 52nd reunion was discussed and it was decided to have one on June 10, 11, 12, at the Melrose Inn, Harwichport, Mass., on the Cape. June 13 is Alumni Day at Cambridge. As it was getting late, Joe Wattles didn't show any Kodachromes and we adjourned about 9:30 P.M. The second dinner meeting will be held on Wednesday, January 6, 1960, at the M.I.T. Faculty Club.

Jimmie Burch writes from Dubuque, October 29, 1959: "Thought you might be interested in the newspaper pictures of the boss. We are all well and busy and looking forward to next June. Sunday, I am driving to Des Moines via Iowa City, where the oldest granddaughter, Nikki, is a freshman at the University. My daughter, Mary Burch Patton, has passed her bar examinations, Juris Doctor degree, and will be sworn in at a session of the Illinois Supreme Court November 19 at Springfield. Business has become very quiet, possibly on account of the steel strike, but this should be only temporary. Right now the banking business is much more rewarding than the sash and door business."

George Belcher received the following interesting letter from Bill Grimes who is living in San Miguel de Allende, Mexico. I imagine some of you have visited the city: "We've been here for almost three years and love it. The city is about 250 miles northwest of Mexico City, at an elevation of 6107 feet, and has a population of about 12,000. It is one of the few national monuments of Mexico, since the revolution against Spain started here, and General Allende was executed here by the Spaniards in 1811. Built upon hillsides, the streets, besides being narrow, are steep as well as cobblestoned, so that walking isn't easy. It now is a Mecca for tourists and artists. The big school here, which we attend (Instituto Allende) has, during the summer months, 300 or more students from all the states and some foreign countries. While the school has mainly art courses (painting, sculpture, murals, lithography, ceramics, and so forth), they also have courses in photography, and Spanish, which we are both taking. I have acquired quite some facility in Spanish; my wife not so much.

"Although one can buy a house here, he must not change the exterior! Remodel the inside, yes, but maintain the old colonial exterior! San Miguel is pure colonial and must stay so. It attracts artists and photographers from all over the world. Cantinflas, Mexico's leading comedian, owns a house here. Also Pedro Vargas, singer-actor, and Pepe Ontiz, retired bullfighter. The center of the town is the plaza or *jardin.* It faces a Gothic cathedral built by an Indian architect from postcard impressions of French cathedrals. It has a tall spire, with bells—a great exception to the city's otherwise uniformly colonial architecture. This is a fiesta city! Officially there are over 30, many lasting weeks. However, any excuse goes for a fiesta, and the people gladly join in. All told, life here is fascinating

— we're in love with it and glad we picked it for retirement." Cantinflas, who Bill mentions, was co-starred with David Niven in "Around the World in 80 Days."

Have you subscribed to the Alumni Fund? If not why not make it one of your New Year's resolutions and do it soon.

Harold S. Osborne has been nominated by the Alumni Association for the position of Alumni Member on the M.I.T. Corporation Visiting Committee for the Department of City and Regional Planning.

How about some news? — H. LESTON CARTER, *Secretary*, 14 Roslyn Road, Waban 68, Mass.; LESLIE B. ELLIS, *Treasurer and Assistant Secretary*, 230 Melrose Street, Melrose 76, Mass.

'09

In the November Review we stated that we would continue to include news taken from the replies to the 50th reunion announcements. Below is one from Royce Gilbert, XI, to Molly, from Umatilla, Fla.: "I had hoped to see you at the reunion and tell you of our adventures since our last talk. I am giving up going now as our daughter and family will be with us the first three weeks in June. It was the only time they could come so John (Doris' husband) gave up his 25th M.I.T. reunion and I gave up my 50th.

"Victoria has had a very bad time with her eyes. She had a cataract removed last September (1958) and the eye developed adhesions and has just recently cleared up. She now has 20-20 vision but will be troubled with double vision unless she wears contact lenses which she doesn't want to do. We moved down here, selling our house in Tuckahoe, N. Y., and I have built a house to suit us. We are on the shore of a beautiful small lake and I can step out on our pier and catch a bass in my slippers. The house is equipped with a heat pump so that we have comfortable temperature and humidity the year around. Victoria is planting a nice garden and I have had good luck with my roses, which are the only part of gardening I have learned anything about. I am completely retired, only doing a little writing now and then. I have just given up trying to keep abreast of the development in electronics. They are coming too fast. We are in the midst of a community that is infested with scientists from all over the country. We are at the start of the real summer here and find it quite enjoyable. It is very hot in the sun in the middle of the day, but the evenings and mornings are heavenly. Please extend our best greetings to your family and remember me to any of the '09ers."

A letter from Mrs. Clarence Reeds to Francis Loud, VI, from Oklahoma City, Okla., states: "I thank you for the invitation and program of the 50th reunion of the Class of 1909 at M.I.T. of which Clarence was a member. Since his death in 1952 I have been employed at the Oklahoma Geological Survey and will not be able to be away at this time. I remember some reunions many years ago which I enjoyed very much. If Mrs. Desmond is at the reunion, please tell her I have enjoyed the book "The Bewitching Betsy Bonaparte," and I gave a very brief review of it at a University Women's Book Review Group. I hope your reunion will be most happy and wish more could be present."

Another from Mrs. Harold I. Eaton from Margate, N. J.: "The literature on the '09 reunion and other activities is most interesting. Harold and I used to run up to New England many times for such affairs. Thank you for the invitation. I regret, due to previous out-of-town appointments, that I shall be unable to attend. (Mrs. Eaton has kept in close touch with the Class and has made a most generous contribution to the 1909 memorial fund in memory of Harold.)

More recently Mrs. Thurston C. Merriman wrote to Art Shaw, I, from Sarasota, Fla., with news we are all saddened to learn: "I regret to tell you that my dear husband died on August 16 in Sarasota Memorial Hospital of a pulmonary embolism which occurred when we thought he was on the mend after a drastic operation for ulcers. It made him very happy to be one of the reuners of 1909. His illness began shortly after that weekend, though that weekend was not the cause of his illness. I wish I could contribute to the class gift and probably I can if and when Thurston's affairs are settled. My regards to Mrs. Shaw, whom I enjoyed meeting, and to yourself." Art has written Louise a note of sympathy and we know that the members of the Class are sorry to lose a loyal classmate like Thurston. We are glad that we were able to see both of them at the reunion. Thurston was born in Hartford, Conn., and prepared at the Torrington High School. While at the Institute he was a member of the Mining Engineering Society, Rifle Club, and Tech Show Dancing Sextette. He performed his thesis with the late Herbert Stiebel. We remember him well at the 40th reunion at East Bay Lodge, for he played golf at the Wianno Country Club with George Wallis, II, and your secretary.

We also received from the Alumni Office a notice of the death of Captain Lee S. Border, XIII-A, USN Retired. He was born March 9, 1882 in Webster, Iowa, and graduated from the U.S. Naval Academy at Annapolis before coming to the Institute in our third and fourth years to study naval architecture. He was a member of the Hammer and Tongs, Iowa Club, and Society of Naval Architects and Marine Engineers. Our records show that he was stationed at several navy yards, particularly on the West Coast, such as Mare Island, Calif., and Puget Sound, Wash. For many years he was stationed at the Navy Department at Washington, D. C. We all regret his loss. — CHESTER L. DAWES, *Secretary*, Pierce Hall, Harvard University, Cambridge 38, Mass.; GEORGE E. WALLIS, *Assistant Secretary*, 185 Main Street, Wenham, Mass.

'10

During the past month there has been no news from members of the Class outside of those working on the 50th reunion for next June. Jack Babcock, chairman of the reunion committee, has been giving time and effort to get things underway. Jack, who is living in Portland, Maine, comes to Boston nearly every week and we hold a meeting at the Faculty Club. Attending these meetings are Hal Manson, George Lunt, Ralph Horne and your secretary. Not only is the reunion discussed at these meetings but Jack, who is class agent for the Alumni Fund, can devote some part of the meeting to the problem of better participation by classmates to the Fund. If I were to give the proposed program now decided upon by the committee, it would be but a repetition of the information each member of the Class has received previous to receiving this issue of The Review. The New York City 1910 luncheon club has been more or less critical of some of the proposed places for a reunion but has been most helpful in making suggestions for locations which have appealed to the committee and the selection of which will assure a good time to all attending. Carroll Benton and Larry Hemmenway are the New Yorkers who have been most helpful in writing and telephoning the opinions of those attending each monthly luncheon. I have been repeatedly asked at our meetings, "How many do you figure will attend the reunion?" It is my estimate that there will be more than 70 members attending with most of them bringing their wives. I met John Gray recently. He is enthusiastic about the reunion and he said he hoped to have every surviving member of Course IV attend by writing personally to each one. If any members of the Class have delayed in answering the reunion notices, let this be a reminder to do so at once so that the committee may know what to provide for. — HERBERT S. CLEVERDON, *Secretary*, 120 Tremont Street, Boston, Mass.

'11

Henry Dolliver, I, at the request of class President Don Stevens, II, has accepted the post of class secretary, and will try to live up to the standards set by our beloved and capable Dennie, which will mean a lot of hard work and concentration. The quotations below are from notes sent to Henry by Don:

"When you accepted the post of secretary of the good old Class of 1911, I at once thought of our undergraduate days. Of course everyone remembers our one and only other secretary — lovable, capable Dennie. You and Dennie came from the same town, Framingham, Mass., and both went to Framingham High School. During undergraduate years you kept busy in many interesting ways besides books and studies. There was the tug-of-war in Freshman and Sophomore years, Tech Show chorus and Tech News staff in Junior year, with subsequent promotion to associate editor. In Senior year you were elected class clerk and to the class day committee. Among the class officers to whom your election as class clerk attached you in our Senior year were myself, Dennie, Ted Parker, I, and Gordon Wilkes, II."

As of early last November, 82 classmates had contributed a total of $1,424 to the O.B.D. memorial fund. The goal of the fund is to install a specially designed

memorial window, in memory of Dennie, in Framingham's Trinity Church. Additional contributions are still necessary if our goal is to be achieved. Following are quotations from a memo from Roy MacPherson, II, chairman of the fund:

"The memorial window will consist of two parts; first, the glass which will control the light and establish the desired color; secondly, the design of the window, executed if possible in aluminum, fitted over the inside of the glass so that the design will be outlined against the glass background. It is proposed that the aluminum be finished in gold so that the design will be effective both during daylight hours and at night when the glass will be dark. The design makes use of three basic Christian symbols: wheat, the grapevine, and three circles representing the Trinity. The window is directly in back of the altar, and dominates the chancel."

There were exactly 11 Eleveners at the annual "seven-come-eleven" dinner at the M.I.T. Faculty Club last November 7. Present were Oberlin Clark, II, Henry Dolliver, I, Bill Fortune, I, Fred Harrington, I, Jack Herlihy, II, Charles Linehan, I, Roy MacPherson, II, Carl Richmond, I, Suren Stevens, IV, O. W. Stewart, I, and Norman Wade, II. Harold Lord, II, and Gordon Glazier, VII, had expected to attend, but didn't come. Henry and Jack moderated the meeting. Obie Clark reported that he is associated part time with Nelson Precast Concrete Company of Braintree. One of the projects on which they are currently working is related to the design and production of the new interchange at Routes I and 128 in Lynnfield and Peabody, Mass.

Bog Stevens reported his present affiliation with C. J. D'Amato Associates of Boston. They are also working on the interchange. Other present projects are interchanges in Haverhill and Route 3 in Hanover. Carl Richmond's son Johnny, an Air Force pilot stationed in England, flew from there to Washington, D.C., in November but unfortunately didn't have time to visit his family, as he had to fly an F-101 back to England before they had a chance to get together.

Stewart said that his vast blueberry patches had been attacked and badly damaged by birds until he prepared and installed special nets over the plants. Birds still land on the nets, but can't get at the berries. He also had some trouble with small rodents, but outsmarted them. O.W. is retiring from his office as president of the Massachusetts Blueberry Growers' Association, and accepting the office of chairman of the research committee.

Obie Clark also mentioned that he and his wife had vacationed in the Virgin Islands last spring, and the following quotations are from a letter he wrote to your secretary, by request, the day after the dinner: "Early last March, my wife Alma and I drove out to call on Emmons Whitcomb at his travel agency in Wellesley. We specified four things that we wanted in a vacation: 1) to be far enough south to be sure of the weather; 2) an informal hotel with good food; 3) located on a beach for bathing; 4) proximity to a town for shopping. After some discussion, we settled on Hotel on the Cay, Christianstad, St. Croix, Virgin Islands. We flew direct from Boston to San Juan, Puerto Rico, and thence to St. Croix. The hotel is on an island in Christianstad harbor, and we reached it in a small boat, manually propelled by oars. The weather was fine but on the hot side — up to the high 80's every day and high 70's at night. The food was good, but sometimes unusual — conch meat for supper one night. St. Croix is a free port (no duties) and Christianstad has many fine gift shops, with beautiful, colorful, and original merchandise at low prices."

Cards were returned to Jack by the following classmates who were unable to attend the dinner: John Alter, IV, Ernest Batty, II, Marshall Comstock, VI, Fred Daniels, VI, Calvin Eldred, VI, Carl Ell, XI, Harold Hallett, VI, Maurice Lowenberg, VI, Morris Omansky, V, Munroe Pevear, IV, Donald Stevens, II, Gordon Wilkes, II, and Walter Wilson, X.

Batty wrote: "November 7 happens to be my grandson's birthday, and every other year I have to go to his party." Comstock: "Very sorry, but we made plans some time ago to spend that weekend at our son Charles' home in Weston, Conn. They advise us that we may expect our eighth grandchild next April (their first child). Perhaps this will be the first to carry on the name." Eldred: "I am still confined to my house, convalescing from two major operations earlier in the year." Perk up, Cal!

Carl Ell: "I regret a conflict in dates. As President Emeritus I still find much to do for Northeastern." Hallett: "Retiring as of November 30, 1959, as chief supervising engineer, division of building construction, Commonwealth of Massachusetts." Lowenberg: "Saturday is difficult for me. Back teaching two days a week at Franklin Technical Institute." Omansky: "Once again a sudden change in my activities (I have had many this year) will prevent my attending." Pevear: "All goes well with me in retirement. I spend half a year in Barre, Mass., and the other in Boston. Good luck to you all."

President Don Stevens: "Wish I could (attend). I liked your October 1 Alumni Fund letter and sent a contribution. Best wishes to all. Please lead a cheer for Dennie."

Notice has been received from the Alumni Office of the death of Arthur Underhill, VI, on July 24, 1959. Before his retirement he was a rate engineer with the Buffalo Electric Company. He was living in Buffalo at the time he died.

Also we are advised of the death in 1956 of Louis Walz, V, of Batavia, N.Y., and in 1958 of Ambrose Gring, X, in Brookline, Mass.

The following address changes have been received: Harry R. Tisdale, V, 8151 Lagoon Road, Ft. Meyers Beach, Fla.; Harry E. Lake, I, 154 Longwood Drive, Ormond Beach, Fla.; James J. A. Gannon, III, 310 Grove Street, Waltham 54, Mass.; Edwin Pugsley, VI, 76 Everit Street, New Haven 11, Conn.

Well, as they say in the "funnies" — "That's All, Folks." — HENRY F. DOLLIVER, *Secretary*, 10 Bellevue Road, Belmont 78, Mass.; JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Drive, Medford 55, Mass.

'12

Word has just been received that Henry C. Smith, of 3900 South Crysler Street, Independence, Mo., has been partially paralyzed for the last seven years. He would greatly appreciate hearing from any of his old friends. Jay Cather was able to obtain a little business for his patented bird feeder through the mention made in class notes several years ago of his new venture. He is now bringing through a second lot of 100 and is trying to build up a backlog ready for shipment before Christmas. He is advertising in the October issue of *Audubon Magazine* and wonders how he is going to find time to take the trip to Barbados that he and Liz had planned this winter. Jay states that although it is a small business he is busy with patent lawyers, advertising agents, and chasing materials. It sounds to me like a very interesting venture.

Harris E. Dexter, VI, has just been honored by Rotary International by his election as district governor for the current year. Among his duties will be the visiting of each Rotary Club in his district to offer advice and help on Rotary service activities and administrative problems. Before retirement in 1957 Harris was director and vice-president of the Central Hudson Gas and Electric Corporation in Poughkeepsie. Among his other outside activities have been the chairmanship of the Traffic Commission and membership on the Advisory Board on Vocational Education in Poughkeepsie. He has also been a director of the Empire State Chamber of Commerce. After serving as an officer in World War I, he was consulting engineer in China for five years before joining the Central Hudson Gas.

Your secretary enjoyed a very pleasant call from Jim and Mrs. Cook who had with them Harold Brackett and a Miss Forbes. The Bracketts were visiting the Cooks in Marblehead over the weekend and they were all good enough to drop in and give me the news of their recent doings. — FREDERICK J. SHEPARD, JR., *Secretary*, 31 Chestnut Street, Boston 8, Mass.; JOHN NOYES, *Assistant Secretary*, 3326 Shore Crest Drive, Dallas 35, Texas.

'14

If every member of the Class would drop a note to your secretary once a year, what a fine column this would be! Why not send us news of some classmate you heard about or especially about yourself? Your classmates like to hear about you and our other classmates, even if it is only a line or two.

One of your secretary's fine aids is Bob Moorhouse. This month he wrote in telling about new honors for Ray Dinsmore. Ray has just been named the top technical man in the Akron area, by the engineering and scientific societies of that region. He was also just awarded his 45-year service pin by his company's chairman of the board, E. J. Thomas. Dinsmore is credited with keeping the Goodyear Rubber Company technically

foremost in the industry. Rucker Bristow was formerly a frequent correspondent, but has not been heard from since he attended the reunion. From another citrus man your secretary learned that Rucker is very busy working on a new process for merchandising citrus fruits which may revolutionize the industry. Best of luck to him. Rucker's home is in Dunedin, Fla.

The real prize should go to Alden Waitt (Major General retired). Not only does he travel all over the world, but he often drops a line to your secretary. I only wish space permitted me to quote some of his letters. The last letter was from Rawalpindi, Pakistan, written just after flying across the Himalaya Mountains — which your secretary understands is one of the worst flying regions in the world. Alden writes he was in an old DC3 two-engine freight plane. He writes he said a prayer of thanks for Don Douglas, who developed this plane. Alden's son is stationed there as a major in the paratroopers. Waitt had previously been in Germany where his daughter, married to a medical colonel, is stationed. I expect that by the time these notes are printed Alden will be — or have been — at his home base of San Antonio, Texas, running the Art Club or the Science Fair; most likely both.

Frank Atwood had expected to attend our reunion, but his real estate at Edgartown, Martha's Vineyard, prevented him. His wife has for many years been both a real estate operator and interior decorator at Newton, Mass. They have retired to Edgartown and have built one of the finest spots on the island. It started out as a motel, but has been expanded to a real hotel. It is highly recommended for one wanting a good vacation place. It is known as Katama Shores. There is a full dining room as well as a cocktail lounge.

One of the group of medical men who took special courses in the biology department was Franklin Fette. Your secretary talked with him recently at Palo Alto, Calif. It was therefore with great sorrow that your secretary learned of his death last June 27. He originally came to the Institute from Wellesley, Mass. He spent many years in China, then retired to California. No details of his family are available.

These notes will appear about the first of the year, so Happy New Year to all! And during the New Year write one of your class officers. — C. P. FISKE, *President,* Cold Spring Farm, Bath, Maine; H. B. RICHMOND, *Secretary,* 100 Memorial Drive, Cambridge 42, Mass.; H. A. AFFEL, *Assistant Secretary and Class Agent,* R. F. D. 2, Oakland, Maine.

'15

Happy New Year! What a Class! On November 6 at the M.I.T. Faculty Club, 28 classmates and guests gathered for another big class dinner. This was an excellent attendance and a tribute to the wonderful spirit and friendships in our Class. Larry Bailey, retired, is back with us and living comfortably at South Duxbury, Mass. Other retirees were Frank Murphy, Ed Sullivan, Fred Waters, Stanley Osborn and Louie Young. Present also were Bill Brackett, Sam Eisenberg, Reggie Foster, David Hamburg, Jim Hoey, Jr. (president, 1943), Wink Howlett, Clive Lacy, Larry Landers, Azel Mack, Archie Morrison, Harry Murphy, Ben Neal, Charlie Norton, Wally Pike, Pirate Rooney, Chet Runels, Jac Sindler, Bill Sheils, Easty Weaver, Pop Wood, and Max Woythaler with Lou Clements. This is just about tops!

Speed Swift was laid up in the New London, N. H., Hospital, so we all signed and mailed a card to him, with our best wishes for a complete and speedy recovery. Regrets came from Bur Swain, Bill Spencer, Frank Scully, Jack Dalton, Dinger Doane (retired in Wilmington, N.C.), Sol Schneider and others, all of whom hope to be at our 45th reunion in June. With a generous check, Wayne Bradley, General Manager, Griswold Rubber Company, Inc., Moosup, Conn., wrote: "I had hoped to attend the class dinner November 6, but unfortunately I have been compelled to change my plans. I am a bit upset over this, as I have not attended a class meeting for some time and had surely hoped to make this one. I believe you know that we bought a factory in Moosup, Conn., a couple of years ago and now have a good home for our rubber company, which has grown considerably in the past few years. I wish you would make it a point to stop in when you are in this part of Connecticut. I am usually in Tuesday afternoons and on Wednesdays and Fridays. Also, please say 'hello' to the boys for me."

Henry Daley wrote: "You will have to include me 'out' as we are leaving on October 21 for a trip south which will carry us down as far as Miami. We will be gone at least three weeks possibly a month. I will plan to attend the New York dinner in late January. Both Frances and I thoroughly enjoyed the many events of Alumni Day, especially the wonderful '15 cocktail party and the earlier informal get-together at Mack's Tavern. It was good to meet so many of the gang and their daughters (they must have been their daughters because they looked too young to be their wives). Am thoroughly enjoying my retirement since being 'fired' last January 31, after 43 years with the Sturtevant Division at Westinghouse, less time out in 1917–1918 in the Air Service making the world safe for the Democrats." Please note that old world humor about the wives of the Class — well they are a good-looking group of ladies!

It was a pleasure to welcome this fine bunch of classmates and guests — although they really, by now, are not guests, but simply "younger members" of our Class with their regular attendance. Lou Clements always comes with Max and, of course, Bill Sheils and David Hamburg are regular sons of the Class. Frank Murphy, Jr., could not make it this time. Jim Hooey, Jr., is also part of 1915 by now. It was a great pleasure to have with us again Reggie Foster and Chet Runels, way down from Lowell, Mass. Long-distance honors ended in a close race among Charlie Norton from Martha's Vineyard, Stan Osborne, who said he took a ship up from Hartford, Conn. (he may even have walked on the waves), and the *winnah,* Ben Neal from Lockport, N.Y. Max and Clive spoke about our splendid and generous participation in the Alumni Fund. Chick Kane'24, Director of the Fund, is doing an admirable job and our Class is right up there at the top backing him up. Do your bit for 1915 — for Max, Clive, and Chick.

Ben gave a stirring and appealing talk on our 50th reunion fund. He held the attention of everybody and received a rising vote of thanks from us all as a tribute to his tireless and energetic devotion to this work. He's doing a perfectly swell job for 1915 and for M.I.T., and deserves our support with generous contributions. He has received some substantial ones recently — how about yours? The smallest amount will help. No one knows what anyone gives — this is wholly between Ben and Mr. Snyder, Treasurer of M.I.T.

The *big* business of the evening was the plan for our 45th reunion at Snow Inn, Harwichport (Cape Cod), Mass., June 10-13, 1960. Wink Howlett had set this up, and he did a fine job; Wink spoke at length to the dinner group, describing the place and the plans, details of which will be sent you shortly. It looks like another perfectly swell reunion for us. Many thanks to Wink for his time and work on this.

On October 5, at Saint Peter's Church, Petersplatz, Vienna, Austria, Frank and Mary Scully's son, Robert Gay, was married to Miss Rosemarie Höpler von Hermingen. After a wedding trip in Europe and Northern Africa, this young couple will live in New York City, where Bob is associated with Frank in the Scully Signal Company. From 1915 to the bride and groom, go our hearty congratulations and sincere wishes for a long, happy life.

At the October 26 meeting of the Alumni Council in Cambridge, Phil Alger attended as a delegate-at-large from Schenectady. Clive Lacy and I spent a pleasant evening with him. Phil, retired, had been on a trip with Mrs. Alger and true to his word sent this interesting story of his colorful and exciting experiences: "As you commanded, I send you an account of our travels from Schenectady to Seattle via Bergen. Helen and I sailed from New York on the Stavangerfjord on March 26, just in time to run into a big storm. The tablecloths were kept wetted down for three days, but no harm was done, and the passengers gained priceless material for story-telling at home. The Norwegian ship's doctor at our table was a delightful character, who had served with the U.S. troops in Korea as well as with the Royal Air Force in World War II. We paused briefly at Stavanger, known to seafaring men as the black city because of its (unrespected) ancient blue laws. At Copenhagen we saw the beautiful statue of Hans Andersen's mermaid; and were delightfully entertained by a professor-friend at the university. On to Stockholm, where we had a fine view of the Nordstrom from a front room at the Grand Hotel. We remember best the fine statue of St. George, the Dragon, and the Princess in the great cathedral. It appears that George wounded the dragon to just the right degree, then had the princess lead him with a rope to where the people were gathered, and there slew him, thus

gaining full publicity for his great deed. Next, on to Uppsala where the Viking king mounds and the university are. The rune stones commemorating Vikings who did not return from their ocean voyages interested us very much. We particularly enjoyed being shown around by the famous lightning expert, Dr. Harold Norinder. He has a laboratory provided by the government, under the Swedish 'Lex Norinder,' a law passed for the benefit of Laboratory Directors Emeriti. We flew on to Oslo, where we admired the ancient Viking ships, the Kontiki raft, and Nansen's Fram, besides enjoying the first warm day of spring. Norwegians are delightful people, with all the good qualities one could ask for. Their country was wrecked by the Nazis, and they have had to rebuild their whole merchant fleet, so it is not surprising that there is a national sales tax of 11 per cent, besides a steeply rising income tax. As they say, their country has plenty of nothing, aside from their mountains, fjords, and snow. Then by train to Lillehammer, the center of skiing, where we found plenty of snow and cold winds, besides beautiful weather and pleasant company.

"And so to Trondjheim, with the university, about a degree south of the Arctic Circle. Here also we were regally entertained by a professor-friend, whose ideas on education appealed to me very much. From here we took a boat down the coast to Bergen, passing many islands and snow-capped mountains. As usual, I visited the university, a fine institution, and we also took a side trip to see an experimental forest area. A young forester showed us belts of Sitka spruce, western cedar, and Douglas fir; that far north the treeline comes at a little above 3000 feet, and the soil is largely bare rock. The highlight of our visit was a two-day boat trip down the Hardanger Fjord, one of the grandest in Norway. The boat stopped at many villages, which can be reached only by water, and we were fascinated to see all the young people who came down to meet us. To get to the boat we had to take a train up to Voss, where there is an old church and St. Olaf's Cross, commemorating the first Christian king (about 1040). A taxi ride up into the high mountains above Voss was a delightful experience, in spite of the rain.

"From Bergen the good ship Leda took us over the North Sea to Newcastle, where my nephew met us, and we spent three days with the family. A young British friend came up and drove us down to Rugby, allowing me to take in the art of left-hand driving as an observer in the front seat. We stayed at Rugby for several days, visiting the BTH Company, seeing two plays at nearby Stratford, and tripping about to Coventry, Warwick, and Cambridge. We had a grand time being shown over the university by Professor Middleton, who is a most convincing advocate of the virtues of a Cambridge education. At last, we ventured south by ourselves, taking the byways to avoid traffic, pausing in Oxford, and reaching London at the quietest time on a Sunday afternoon. There we put the car in a garage, and relied on the doubledecker buses to take us around. I talked at length with professors at Kings College, Imperial University, and the Institution of Electrical Engineers. Here I gave a talk to a group of educators, and attended the annual dinner, making some very pleasant new friends. After climbing the 371 steps to St. Paul's outer gallery, and seeing as many sights as possible, we drove off in the early morning, to Winchester and Salisbury. From here on we saw so many cathedrals, battlefields, universities, and historic sites that we became quite dizzy. At any rate, our memories are filled with anecdotes, but it seems quite impossible to give a connected account of all we saw and did. Suffice it to say that we found many ancestral records, took some 300 colored pictures, made many new friends, and had a wonderful vacation.

"After seeing Stonehenge, Bath, Shrewsbury, Bristol, Sheffield, Manchester, and the Roman wall, we reached Edinburgh, the site of the famous Castle, the War Memorial and Holyrood palace. We rode the royal mile in a horse-drawn vehicle of Victorian vintage, with a gentleman driver of the old school. His rich Scottish burr and his many anecdotes are cherished memories. From here to St. Andrews to see the Royal and Ancient Golf Course and the university. Then on to Perth, where we met an old Scotch friend, who became our guide and host on a week-long tour of the highlands, ending at his house at Dunoon, overlooking the Firth of Clyde, with its never-ending parade of ships of all nations. En route home we drove by way of Dumfries to see the 'Auld Brig O' Doon' and relive the famous ride of Tam O'Shanter and his old mare Meg. And on to Carlisle and Newcastle, where we turned the car back 2,500 miles from the start, and entrained for London and Southampton. The Queen Mary took us smoothly across to Ambrose Light and the welcome Statue of Liberty, so that we reached home on June 16. We just had time to repack, and then took off by air for Seattle, where I had a command date with the American Institute of Chemical Engineers' summer convention. This chore accomplished, friends drove us to Mount Rainier and for a week in Glacier Park with its lakes, and snow-capped mountains. At last our friends left us and we boarded a Great Northern train for Chicago and home. Now that we are settling down to the life of a professor, we are gathering our resources to make the trip all over again."

The Review's editor left out part of Loring Hall's report in November on his recent travels, so we will make amends now. Of the countries that he saw, South Africa, Thailand and Hong Kong seemed to be making the most progress, and doing it without big handouts from Uncle Sam. In India, he was told by some of our own government representatives that the millions we have sent there are wasted. His letter continued:

"While Nehru builds his grandiose projects the lot of the common man gets worse — if possible. It looks like a hopeless situation unless the Indian philosophy of 'leaning' is changed so that they will learn to do something for themselves. The Rockefeller Foundation has done the most in that direction and deserves more credit than it is given in the press. The Philippines is another bad spot. The Filipinos blame their plight on the fact that we don't pay them as individuals the reparations due for getting them involved in our war. They shrug off the huge amounts we have paid to their government, and I must admit that most of it sticks to itchy palms along the way.

"In marked contrast are the conditions in Hong Kong, the little British colony that has become the last refuge of really free enterprise. They ask alms of nobody, but go about their business with such energy and intelligence that they are even underquoting Japan and West Germany on many products. There are no currency restrictions, no import tariffs, no bureaucratic red tape and no labor unions. Taxes are low and yet the council is able to keep up all the necessary services and build huge apartments for the refugees that keep coming in by the thousands from Red China. Money is pouring in from all over the world to be put to work in Hong Kong. The people seem to be happy and to enjoy working, in spite of long hours and the absence of coffee breaks and other fringe benefits. There is no agitation for a change in the form of government. I think the residents, who are mostly Chinese, realize that if they cut loose from England the territory would be quickly swallowed up by Communist China. Hong Kong is a good example of what can be done by hard-working, intelligent people of any race if government keeps out of their way. The progress being made by the Japanese is a revelation, too, but it still remains to be seen what they can do when and if the U. S. military expenditures are discontinued. Tokyo looks more like an American city now than New York does."

For our annual New York City class dinner, Larry Landers has done it again and set this up for us at the Chemists' Club, 52 East 41st Street, for Friday, January 29. Bur Swain will again handle the details. Last year this pair did a wonderful job. Save the date; plan to be there.

Help! Do your bit for 1915 and M.I.T., for Max, for Clive, for Ben, and "help Azel." — AZEL W. MACK, *Secretary*, 100 Memorial Drive, Cambridge 42, Mass.

'16

From up near the Massachusetts-New Hampshire line, our President, Ralph Fletcher, brings the opening message in the column for this month:

"I'm very pleased to have this opportunity to say hello to you again, and may I express my sincere hope that this will be a year of good health and much happiness for all of us. Harold Dodge continues to do his job wonderfully and has kept us very well informed on recent class activities and the individual experiences of so many of our classmates. Bill Barrett and Joe Barker are still giving their personal attention to the Alumni Fund and 50-year gift fund, and the results are encouraging. Jim Evans keeps right after us for attendance at the monthly class luncheons at the M.I.T. Club in New

York City, and his great pleasure comes from the steady attendance of classmates in that area and the occasional unexpected visitor who just happens to be in the area on the right day and at the right time. I congratulate these men on their fine efforts on behalf of the Class of 1916 and I urge everyone in our Class to do whatever he can to help them. Finally, may I say a sincere thank you to the many who joined together to give me that wonderful evening at Locke Obers in August? This truly was a complete surprise, and one of the greatest joys in my life. I shall cherish the memory always, and in the meantime am finding the chair very, very comfortable. Will hope to see many of you at the reunion—June 10-11-12, 1960."

Cy Guething reports that he's pretty much retired, that he and his wife enjoy fishing and nice people's company: "Over the years we have had our eyes open for those places which we call nearly ideal. In summer, it is the Ojibway, Pointe au Baril, Ontario, on Georgian Bay. In the winter it is Pink Sands Lodge at Harbour Island, Bahamas. At both places the guests are selected and food and fishing are excellent. At the Ojibway we have furnished and decorated our quarters for parties and happier rainy days." He says further that they are taking their son Ted and his family down to Harbour Island for the holidays and are then staying on four to six weeks for the required rest. He's sorry to have missed the Steve Brophys who were guests at Pink Sands last season. He says: "It appears I shall have to change my routine slightly next spring and take my first and last trip to Europe. Am told that it is a 'must' just once during one's lifetime, but I don't believe it." This trip will interfere with attendance at the 1960 reunion but he won't miss the 45th in 1961 "providing I'm still breathing with fair regularity."

The fall 1959 educational edition of the *Wiley Bulletin* (John Wiley and Sons, Inc.) has a penetrating article by Vannevar Bush, "The Gentleman of Culture." It considers why there is a wave of anti-intellectualism in this country, and what can be done about it. His talk on this subject at a recent annual meeting of the Pingry School in Elizabeth, N.J., so impressed the publishing house of Wiley, it has been reproduced in its entirety.

Charles Cellarius tells of the happy task he and his company, Cellarius and Hilmer, Cincinnati, have had in planning with Bob Wilson, the new Wooster Inn, which was formally opened in October. As Charles puts it: "You may be interested to note that one of our classmates, Robert E. Wilson, has given to the College of Wooster, the major part of the funds to build the Wooster Inn. It is a colonial building modeled after Mr. Wilson's old home in White Plains, N.Y., and is a very handsome and valued addition to the College of Wooster. Cellarius and Hilmer were the architects." And Charles himself has just come in for a very high honor—an honorary L.H.D. (Doctor of Humanities), conferred on him by Miami University in Oxford, Ohio, at the 23rd summer commencement exercises August 26, 1959, when he gave the commencement address. The program gives an outline of his very busy and illustrious career. He is known especially for his work in the design of college buildings and churches. He has done buildings for the Western College for Women, Wooster College, and Berea College. Among his outstanding churches are the First Presbyterian Church in Findlay, the First Presbyterian Church in Middletown, the Mt. Washington Presbyterian Church and the Church of the Redeemer in Cincinnati. But notably he has been the principal architect for Miami College for nearly 25 years. Since 1936, he and more recently Cellarius and Hilmer have designed (if I count correctly) 22 college buildings. The firm is currently designing seven additional buildings on the Miami campus. Quoting from the program: "In large degree the Miami University, which this year is observing its Sesquicentennial, is a monument to the asthetic beliefs and handiwork of Charles F. Cellarius . . . We take this occasion to acknowledge that gratitude and satisfaction and we are proud henceforth to claim so devoted a friend as an honorary alumnus of the university." The Class of 1916 is glad to add its congratulations!

Jack Burbank reports attending Lew Pratt's funeral on September 5 at the Waquoit Church. Lew had been a deacon of that church and in recent years was in charge of the restoration of the church. The minister's closing remarks spoke of Lew as "a true and kindly gentleman," a very fitting tribute. Jack says that the Don Websters, who live about seven miles away, had recently been over for an evening meal and a session of bridge. Jack, a Cape Cod retiree as of July 1, 1959, finds retirement most satisfying—between golf at the Wianno Golf Club, house and grounds chores, and his small greenhouse, there's not enough time to do all the things he schedules. He reiterates—his latchstring in Marstons Mills is definitely out for any wandering classmate coming that way.

Kem Dean responded around November 1, saying he was just back in the office after slight surgery 10 days before, not serious, and that he'd be as good as new in a few days.

Francis Stern tells of working with Ed Ken'47, President of the Hartford M.I.T. Club, in arranging to have Dr. W. J. Whitman, head of the Department of Chemical Engineering, talk at the first public affairs meeting in Hartford on October 28. His subject was "Atoms and Peace." The Connecticut General Life Insurance Company made their auditorium available and their cafeteria served a delicious dinner. Says Francis: "The combination of Dr. Whitman's subject and the beautiful surroundings of Connecticut General resulted in some 300 turning out, which is the largest turnout we have had in this area for a long long time. Needless to say Dr. Whitman's talk was stimulating and above all, very hopeful. His entire viewpoint on world conditions and hopes for peace was an inspiring message, and I am sure that the ladies who constituted perhaps a third of the audience, were as enthusiastic about it as were the men, for the talk was completely nontechnical."

Francis leaves early in December for his usual winter visit with his children and grandchildren in Los Angeles. As he says: "If any '16ers are going to be in that neighborhood during January or February, have them give me a ring on the telephone which is listed in my daughter's name: Mrs. Albert S. Cahn, 5314 Onacrest Drive, and is AXminster 4-8297." He expects to spend the month of March in Palm Springs and then motor home shortly after April 1 "for as you know April 15 is the start of the fishing season and there is an unwritten law against being anywhere except on a trout stream on that day."

A card from Aime Cousineau with date line October, Italy, helps to remind the rest of us that there's much to be gained by keeping busy and doing things at least until you approach the middle 70's. He left Montreal in mid-September and had set the date of December 4 for his return. He writes: "I am traveling all over Europe by air with Paris as my 'focus' point. I must say I have enjoyed in the last year or two the 1916 luncheons at the Biltmore in New York." Which is a reminder that these luncheons are held every month on the Thursday following the first Monday of the month at 12:00 noon in the M.I.T. Club of New York quarters in the Hotel Biltmore, right at Grand Central Station. Please write an explanation to Jim Evans (25-31 Fair Lawn Avenue, Fair Lawn, N.J.) whenever you can't make it.

Norm Vile is now living on Plantation Key, Fla. You have to get out your atlas to see how far it is and what a wonderful spot it must be. He says the life down there is "tops"—swimming just 20 steps from the front door. His house is on the Florida Bay shore, with wonderful climate and fishing. He has a consulting engineering business.

An S.S. Independence, American Export Lines, post card from New York in the middle of October signed by Bob and Bill turned out to be a joint message from Bob Wilson and Bill Barrett. Apparently, on returning from independent trips to Europe, Bill and Mrs. Barrett and Bob and Mrs. Wilson were to their great surprise assigned adjoining seats at the captain's table. 'Twas a real interim reunion with 11 per cent (4 out of 36) of the 1959 reunion attendance. The Barretts had taken a boat trip to Italy, covered many points of interest from Pompeii to Switzerland, and re-embarked at Cannes. Bob Wilson had been attending an Atomic Energy Conference in Geneva, and with his wife boarded at Algeciras, Spain. It seems that both groups had demurred when told they were to be at the captain's table, but according to Bill, in a subsequent letter, it was a most interesting table, and Captain Switzer was a delightful host. Bill says Bob "participated in all the indoor and outdoor sports aboard ship, won one or two prizes, and was called up before the assembled ship's company to accept them."

Victor Dunbar writes from Swampscott that he expects to retire in April. He says he had some interesting retirement plans but these had to be discarded when his wife passed on in January 1958. His son, Donald, who lives with him, expects

to receive his Ph.D. in psychology in December 1959 from Ohio State University.

Paul Page Austin, whose letter we reported last month, has given some first-hand comments on Bangkok that are intensely interesting. He says that Bangkok, the capital of Thailand and a city of almost 1,500,000 people, is a pleasant place to live because it has almost no poverty, such as one sees in India and some other countries in the Far East. It is hot and humid every day of the year, but the hottest weather comes in April, May, and June. Then from July through October the monsoon rains come and drop a total of about 50 inches of rain. The rest of the year there is almost no rain. In the hot season: "the temperature goes to about 96F every day, with a minimum of 85 and humidity of 80 per cent. In the rainy months the temperature averages only five to eight degrees lower. Bangkok is a beautiful city with many streets lined with magnificent big trees. In the residential districts, everywhere the eye rests is bright green luxuriant foliage and many flowering trees, shrubs. and plants. But the thing that fascinates me most is jungle, just outside the city, and its never-ending variety of palms, teak, bamboo, and many other trees that I can't identify. Another interesting feature of Bangkok is its system of canals, or klongs, which serve to drain the city and to bring in and distribute the fruits, vegetables, and bulky freight brought down the Mae Nam Chao Phraya River. These klongs are lined with native houses that have no means of access but by water and many thousands live on boats that ply the river and the klongs. The klongs serve as water highways, furnish water supply to the inhabitants of its banks, and also as their bathroom and sewer. Bangkok has several hundred Buddhist temples or Wats, but after visiting three or four of the biggest and finest, the rest start to look alike, so one generally quits there. These few have extensive grounds and a great variety of buildings and statuary. The typical Thai architecture used in the temples is beautiful as applied there, but would look strange if built anywhere else. I couldn't close this letter without a word of tribute to the Thai people. We have found that they have many admirable traits. They are personally very clean, honest, loyal, and intelligent. They are eager to learn American ways and they are very appreciative of what the U.S. government is doing to help them solve their problems. It is an inspiring sight to see the thousands of grammar, high school, and college students on the way to school, the small boys in black or khaki shorts, the older boys in black or blue long trousers, the girls in black or blue shirts. And all the boys wear white shirts, the girls white blouses all spotlessly clean and fresh every morning." As of October, Paul was back in the office of the Rogers Engineering Company in San Francisco and had "no prospects of going away again, for which I am thankful."

Arthur Shuey writes from Shreveport that semi-retirement doesn't produce much news. Says they travel some — two months in Portugal and Spain and a month in England last summer and usually a month in Mexico every winter. They are just a good day's drive from the Mexican border so they get there quite often. Two of their sons live in Shreveport and one is a physical chemist with Rohm and Haas in Huntsville, Ala. He is Dr. Henry M. Shuey, in case any '16ers meet him there. Arthur says further: "Three sons, and nine grandchildren, keep us interested in the younger generation. As we have many lakes at hand we get lots of excellent bass fishing, but usually mix music at Aspen, Colo., with some good trout fishing each summer. I served two nine-year terms on the Shreveport Planning Commission. My wife, Mary Willis Shuey, still writes — both articles and poetry — but has retired from teaching English at Centenary College here."

Arvin Page's account of his and Claire's three months' travels across the country, up the West Coast to Washington state and Vancouver, back through Yellowstone, Salt Lake City, and Pike's Peak, has many interesting items and personal observations. (We can never do justice to his 29-page tract.) He took the "short trip" through the Carlsbad Caverns in New Mexico: "Down the elevator we went about 750 feet to a large chamber in which there is a lunch room and numerous souvenir stalls or counters. In a party of about 150 we were escorted by park Rangers on a walk of a couple miles around a tremendous cavern with thousands of stalactites and stalagmites of different shapes and excellently lighted. It is rather awesome to pass through this underground chamber so vast that a 20- or 30-story building could be erected therein. About half way around the cavern the Rangers made everyone sit down on a series of stone benches while one of them delivered a lecture on the caverns. The main object is to give the older folks an opportunity to rest as the walk is strenuous. While the rest is welcome those stones get cold before the lecture is half over. They won't allow anyone to leave or even stand. I recommend that anyone taking this trip carry some kind of insulating material on which to sit. The tour is well worthwhile but once is enough. Driving back through pea soup fog on a winding mountain road where the mountain goes straight up on one side and straight down on the other is guaranteed to keep the driver awake and the passengers on edge. Got back to the motel in time for cocktails — we needed them."

Paul Duff says that missing Ralph's night in August was a big disappointment. All should know by now that any kind of a party planned by Jim Evans is just one of those things you don't miss, especially when both Sibyl and Ralph are to be there. Paul still recalls the good time he and his son Kip had at the reunion. Kip is married, has a daughter, and is doing well in field work for Strassenburg Company in New York City. He says his whole family got together in September for the first time in six years. He writes: "There were 29 of us this time compared with a roll call of 12 last time. A clever photographer snapped us all with even the 11 grandchildren snappably (?) quiet." Paul is catching up on grandchildren. Our records (undoubtedly not up to date) show Emory Kemp and Moose Jewett with 11, Earl Mellen, 13, Eric Schabacker, 16, Hovey Freeman, 17, and Duke Wellington, 21 (including some by remarriage). Additional statistics for this department will be welcomed.

Bill Drummey came back in October on the Bremen from a business trip to England. He said he flew over, had four hours of business in London, and proceeded to take 12 days to do it. But there was a reason: "I was over tired because we are too busy, a pleasant disease that my young associates find delightful, but which only increases my headaches without other recompense." Bill has bought a new house on Cape Cod Canal, pointing out its chief virtue — an overly lazy fisherman can literally cast for bass from his own back yard.

The November class luncheon in New York was attended by Leonard Best, Jim Evans, Hovey Freeman, Herb Mendelson, Frank Scully'15, Len Stone, and your secretary. With Hovey's and Frank's one-after-another stories it was hard to get the eating started. Len Best was fresh from his triumph on election day — the passing by a nearly 200,000 majority of the college bond referendum in New Jersey. Len was head of a state-wide citizens committee that worked hard to get a favorable vote on this referendum which provides for enlarged college facilities in the state.

We have letters from Steve Berke, E. C. Gagnon, George Petit, and Vert Young, which will be held over for next month's column. We're glad to report that Louise Berke is coming along well and will be at the next reunion. E. C. Gagnon has become president of the Farmers and Merchants Bank of Hurtsboro, Ala. George continues his statistical predictions for clients, and Vert Young gives a delightful account of the African safari he and his wife took starting last June.

And so ends the column for this month. To keep '16ers informed, send along news, notes, or bits of information, either to Ralph Fletcher (Box 71, West Chelmsford, Mass.) or to — HAROLD F. DODGE, *Secretary*, 96 Briarcliff Road, Mountain Lakes, N.J.

'17

Another new year is getting under way, and we are only two and one half years away from our 45th reunion to be held at the Snow Inn at Harwichport on Cape Cod. Make your plans now to attend one of our biggest reunions.

On Wednesday, October 28, Walter Whitman was the guest speaker at a public affairs meeting of the M.I.T. Club of Hartford, held at the sumptuous new office building of the Connecticut General Life Insurance Company. His subject was "Atoms and Peace" and was developed in layman's terms with historical connotations interpolated into the future. Walter pointed out that distrust and suspicion between Russians and the western peoples must be put in the background if we are ever to work out world problems. As an example, he pointed out that in planning for the United Nations Atomic Conference at Geneva, which he chairmanned three or four years ago, he went to Moscow and laid before the Russian scientists the texts

of papers to be presented by western powers delegates. Once they saw that the cards were going to be on the table, they responded generously and effectively. Walter's deputy chairman was a young Russian scientist who did not exhibit any of the characteristics publicized in political discussions. Walter's theme was that we have got to be ready to "give" in order to "get" and "the more we get together, the happier we'll be." His look into the future was one of optimism on two counts: 1) atomic power will be ready to supply all the energy needed by the world when oil and gas become scarce; and 2) the knowledge that the use of atomic power in armed conflict can destroy civilization leads to the optimistic opinion that nations will find other ways to settle their difficulties, probably through United Nations facilities with a possible United Nations police force.

On the retirement front, we have news first from Charles A. Abels of North Tewksbury, Mass. He writes: "Since my retirement in 1954 from A. T. & T. (it must have been at age 60), I have occupied myself with church work — trusteeship, religious education committee and telephone pioneer activities, including terms of vice-presidency and presidency of the local Life Member Club. Various other hobbies include a vegetable and flower garden, and home maintenance. The latter is aided by several power driven labor savers such as roto-tiller, riding lawn mower, snow plow, and emergency engine-generator. Photography and plastics craft occupy my spare time."

David E. Waite was retired from the Wallace Barnes Division of Associated Spring Corporation of Bristol, Conn., on December 1. He writes: "We have long thought that sometime this might happen, so we have built a replica of the old salt box (Farmington) museum at Quonchontaug, R.I. In the last 10 years we have landscaped it the way we wish. We now have adequate living space with guest rooms to use when our grandchildren visit us. We have been going to Quonchontaug for about 30 years, and naturally have a nice group of friends there. Having gone to prep school in Providence, we feel quite at home with many people at Quonchontaug. We hope to take some long delayed trips that business would not allow. In particular, I have a sister living in Honolulu, and my wife has relatives in England and Munich whom we would like to visit. Perhaps when we have settled down, I will do some consulting work in engineering. In fact, ever since starting out at the American Steel and Wire Company in their research laboratory, I have been doing this type of work."

Philip E. Hulburd, who, up to the end of the last school year at Phillips Exeter Academy was professor and head of the department of mathematics, has now retired to Meriden, N.H. Phil writes: "I am now quite detached and remote from the Exeter scene, high up in the New Hampshire hills near Hanover. I continue to be a class agent of my Exeter class, and a trustee of Wheelock College in Boston, which my aunt Lucy Wheelock founded almost 75 years ago in a building only a block or so up from the old Rogers Building on Boylston Street. In fact, some of our classmates will remember that I spent our Freshman year living in the then Wheelock School, at 134 Newbury Street — on the top floor. Lowell Cady was my roommate, and I am sure that a lot of 1917'ers were in that room. I remember, particularly, Dud Bell, Ducky Swan, Lin Noyes, Harry Sandell and Rusty White, climbing the stairs. There were probably many others whom I do not recall. As for the family, my daughter Lucy is married, and lives in Essex, Mass., in an 18th Century farmhouse close to Ipswich Bay. My son Bob teaches German at Phillips Academy, Andover. We have five grandchildren.

"Betty and I are most comfortably settled in our old farm house at Meriden. The house was built about 1800. We acquired it in 1938 and have been gradually doing things to it since then. We have about 100 acres of woodland and fields to look out on, but I do very little forestry or gardening. I seem to be busy doing nothing, except a few odd jobs of interior painting, putting terrace furniture away for the winter, or filling the bird feeding stations. I still haven't read all the books on the list but I'm making progress. I am finding this retirement business something of a problem. My shop is too cold to work in; local activities are not frequent enough to keep me engaged; but, worst of all, we don't play bridge, and I don't like to rake leaves or bring in wood for the two fireplaces. So here we are."

About the only time we get news about Gus Farnsworth is from one of his friends. Phil Hulburd reports that: "Some weeks ago we had dinner with Gus and Julie Farnsworth at their house in Etna, N.H. Gus is about 12 miles from us, but I think he must be about 1000 feet higher, although we are 1000 feet above sea level and can look at Mt. Ascutney from our back terrace. Gus sees Killington, Pico, and Lincoln mountains, plus a lot of other of Vermont's high hills. The sunset from Gus's house was the most gorgeous that I have ever seen." Gus, let us know whether you are going to quit your consulting with Coverdale and Colpitts next March and live in Vermont.

The Associated Industries of Massachusetts announced the appointment of Raymond H. Blanchard as its President at the annual meeting on October 22. Ray is currently president of B. F. Goodrich-Hood Rubber Company, Watertown, Mass. The association comprises 90 percent of the dollar volume of manufacturing industry in the state, and is headed by one of the most representative groups of informed and able executives in New England. The meeting filled the Hotel Statler, and the dinner and talks required the full capacity of the main ballroom. At the passing of the gavel to the new president, Mr. Blanchard made a delightful acceptance speech, and moved into his new responsibility and leadership of the associated policies and problems of Massachusetts manufacturers. The meeting was graced by the only special and continuing out-of-town guest, one Enos Curtin, who has been close to the executives of Associated Industries for some years. Ray will have a real job on his hands in helping to make the Massachusetts climate more healthful for both old and new industry.

Douglas Hull McLellan, who received his S.B. degree in Architecture, died on July 8, 1959. He was a member of the firm of Douglas McLellan and John Fortune of Los Angeles, Calif. Another architect, John Wentworth, of Chicago, Ill., who was a member of the Class for only a short time, died on June 20, 1958, but notice was late in arriving.

For the grandparents who exchange jokes with their grandchildren, the following may be of interest: From a grandson who has learned a new joke: "Grandpa, do you know what dandruff is?" Grandpa, expecting a joke of some kind: "No, what is dandruff?" Grandson: "Why, it's a chip off the old block." — W. I. McNEILL, *Secretary*, 107 Wood Pond Road, West Hartford 7, Conn.; STANLEY C. DUNNING, *Assistant Secretary*, 21 Washington Avenue, Cambridge 40, Mass.

'18

There are many facets to a diamond, each ground with exactness or error by a lapidary who may, or may not be an expert. But in every case the grinding is a slow, delicate process. Ever since acquiring a taste for stresses and strains under the eagle eye of Charles M. Spofford, Craig P. Hazelet has been polishing the facets of his cerebellum on structural design. When the American Institute of Steel Construction offered 15 awards, totaling $44,000, in a competition for the best steel highway bridge designs, Craig was an interested party. Anything to stimulate more imaginative, effective, and economical use of strong modern steels in bridges for superhighways was a jewel the grinding of which he yearned to examine. There were 300 entries in all, about a quarter of which were seriously considered for honors by the judges, one of whom was our own Hazelet of the firm of Hazelet and Erdel, Consulting Engineers. The Class of 1913 was also represented among the judges by Eugene L. Macdonald.

William C. Foster has ground the diamond of his professional life to a high polish on many facets, including industry, government, and education. Bill has been renominated (tantamount to election) by the Alumni Association to serve another term as Alumni member of the M.I.T. Corporation Visiting Committee for Sponsored Research. This committee consists of nine members, three from the Corporation, three chosen by the president, and three Alumni recommended by the Alumni Association. Ordinarily, they meet once a year to give advice and opinions as an interested group not connected with either the Faculty or the Administration of the Institute. Harold Weber is another of the brethren whose skill as the lapidary of his professional career has many a bright and shining facet. He was one of 50 of the country's outstanding scientists and industrialists attending the fall meeting of the Army Scientific Advisory Panel. The panel was established by the Secretary of the Army in 1951. Its purpose is to assist the Secretary and the Chief of Staff in their joint responsibility to give the United States a ground fighting force as effective, economical, and progressive as its scientific, technological, and industrial resources permit.

Tom Brosnahan brightened his European trip somewhat by correctly pointing out that I did not do enough grinding on the facet of my appreciation of the subtle connection between the spoken and the written word known as spelling to know the difference between Thomas Grey, and Thomas Gray who wrote the famous Elegy we memorized in school (see the November notes). Tom did visit Stoke Poges where the churchyard is, and amazingly the pamphlet purchased there containing the history of the place (which goes back to the year 1107 A.D.) says "await alike the inevitable hour," instead of the correct "awaits alike," since it is the inevitable hour which is doing the waiting, not the boast of heraldry, the pomp of power, and so forth. Tom recognizes the correctness of the verb in the singular, but in lighter vein, he asks me: "How can the inevitable hour await when it does not exist at the present time?" Ah, my dear classmates, it did indeed exist today for many a man, and has on every day since mortals became numerous enough. Tom also seeks to help me polish my style by what he jovially describes as a "superfluous use of the first person pronoun." However, having read Quiller Couch's essay on style, I will use I any time I think I is the word I want to use. Though not exactly pertinent to his comment, what could be more falsely humble, or a greater waste of printer's ink than saying, "the present writer" when you mean "I"? Tom points out that he, too, has suffered at the hands of editors, so please not to blame him for the title of any article he publishes. He should have the diamond dust award for writing the class secretary without being plied for news.

Belatedly, information has reached me that three of us have completed their earthly polishing. George H. Ennis died on June 30, 1956; Earl G. Watrous, Jr., died July 2, 1957; and Irving G. Hall, Jr., died sometime in 1958. No other details thus far. — F. ALEXANDER MAGOUN, *Secretary*, Jaffrey Center, N.H.

'19

A note from Wayland Bailey says he is still enjoying life in Norwell. He is keeping busy at Bethlehem Steel, "helping as best I can in their shipbuilding program." His son, David, has just finished a year interning at Massachusetts General and is now a medical officer aboard the USS General G. M. Randall.

Rod Bent is really the sportsman. He and Walt Beadle, retired from DuPont, spent the first 18 days in February skiing in Austria and this winter he is planning to go skiing in Switzerland. Most of the summer he spends fishing Atlantic salmon at his camp on the upper part of the Miramichi River in New Brunswick. He has four grandchildren with another expected next April. His two sons, Gard and Jack, also M.I.T., run a wood working factory (Gardner, Mass.), streamlined with modern equipment, and would welcome visitors.

Thomas Bott writes that his daughter, Joan Bott, is now on the staff of the Westminster Foundation of the Presbyterian Church on the campus of Iowa University, Iowa City. His son, David W. Bott, age 23, is a mechanical engineer with the Norden Company, Milford, Conn., and his other son, Thomas H. Bott, 3rd, is with the University of Pennsylvania Hospital on the administrative staff. Thomas has two children, Victoria Ann Bott and Andrew Thomas Bott. A note from New Orleans from Locke Baum says that he is semi-retired and in good health. He is interested in photography and developing and printing pictures. In replying to a letter about Alumni contacts, Cutter Davis says that he and his wife have returned from a trip to England, Switzerland, and Austria.

Tom Goodwin writes that he is still doing business with Con Edison and will try to make the next reunion. Wynn Gaylord's address is now 91 Crest Avenue, Chelsea 50, Mass. He is ill and living in a soldier's home. Ed Deacon wrote in from Asheville, N.C. We hope he will send some news next time. Kenneth A. Wright has changed his address from Evanston, Ill., to 5555 Sheridan Road, Chicago 40, Ill.; Louis A. Brown, Jr., has a new address: 127 South Doheny Drive, Los Angeles 48, Calif.

We regret to report that we have received notice of the death, some time ago, of Frederick L. Peart, Denver, Colo.; and, also, the death of Webb C. Patterson, Box 349, Waltham, Mass., on October 5, 1959.

Contributions to the Alumni Fund from 1919 are coming in, and we hope those of you who have not yet sent in a check will do so soon. — E. R. SMOLEY, *Secretary*, 30 School Lane, Scarsdale, N. Y.

'20

Walt Sherbrooke has recently been in poor health but is optimistic about an early recovery. Walt, who lives at 49 Margaret Street, Staten Island, has a son who is a freshman at Cornell and a daughter at the Emma Willard School in Troy, N. Y. George Burt is supervising the building and starting up of a modern factory for the Celotex Corporation located not too far from Chicago. Bill Freeman who used to be near Washington, D. C., is now running Runnymeade Plantation in Poplarville, Miss., about 75 miles north of New Orleans. He is raising tongue trees and cattle and he expects to be with us at the big reunion. Another one who says he expects to be there is Jim Scott of Scott and Stringfellow, Richmond, Va.

Toots Kinghorn is located at 6101 Kaywood Drive, Knoxville, Tenn. Art Littlefield's new address is 4430 40th Avenue, North, Minneapolis. Ed Brickett is with Construction Chemicals Company, St. Paul. M. H. Pai is at 2421 Webb Avenue, New York City. He has seven grandchildren. Dick Goldsmith is in San Mateo, Calif.; address 743 Nevada Avenue. Nick Smoley is in Ft. Wayne, Ind. Don Dowling has moved from Connecticut to Connersville, Ind.; address 514 Franklin Street. He is with the Roots Connersville Blower Company. Gardner Coolidge has moved from Rye, N. Y., to Milton, Mass.; address 188 Hillside Street. Art Peterson has moved from Montevideo, Uruguay, and is now in Caracas, Venezuela.

Word has just been received of the death of Jeremiah A. Hallaren of Norwell, Mass. — HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

'21

Happy New Year!

Please return the class questionnaire now! We particularly need your reply to the questions about the reunion in Mexico next March and our 40th reunion, so as to know your wishes and to be able to mail you later details. At your request, we'll gladly forward additional copies of the blank form if you can't locate yours. Our sincere thanks if you have already taken action. Receipt of your biographical data is especially appreciated as well as the "sweetening" for the class treasury to cover the expenses of activities in your behalf.

March 10, 11, and 12, 1960, will see a large segment of the Class and their wives attending the 12th Annual Fiesta of the M.I.T. Club of Mexico City. Again 1921 will set many new records, chief among them for being the first class to have had two reunions in two neighboring republics beyond the shores of the United States. Interest in the coming party is heightened by the fact that the M.I.T. Club of Mexico City will be celebrating its own 50th anniversary. Chairman Chick Dubé of our Mexico reunion committee writes that the "Noche Mexicana" event will see local Alumni and their wives attired in costumes native to various regions of Mexico. Of course, there'll be a *piñata*, the traditional beaver with his sombrero and slide rule mounted on a burro, to be appropriately assaulted with a "kane." Music is to be supplied by a popular marimba and guitar orchestra. Chick says there are all sorts of places to visit during the periods not scheduled for official events of the Fiesta, such as silver mines, native factories for glass manufacture, leather making and hand tooling, and silversmiths plying their trade. Chick's committee has not yet revealed what special 1921 events may be unveiled on March 13 as an extra attraction, so watch your mail if you returned the questionnaire and said you wanted later mailings. Our own Viviano Valdés and Dr. Manuel Sandoval Vallarta are members of the Fiesta council, which means the red carpet will be really out for our reunion-minded couples. Write or phone Chick for hotel information, registration blanks, and other printed matter if you have not already obtained full information. His address is: Edouard N. Dubé, Consulting Engineer, 120 Tremont Street, Boston 8, Mass. His telephone number is Liberty 2-2185. Make your reservation promptly and join our 1921 reunion in Mexico at M.I.T.'s Fiesta time.

The 1921 cocktail party last November 16 was an enjoyable gathering. Fifteen members of the Class met in the penthouse above the Faculty Club at M.I.T. at 6 P.M. and a majority stayed for dinner.

Chairman Ted Steffian welcomed the group and Chick Dubé gave a comprehensive survey of the 1921 reunion planned for the March Fiesta Week of the M.I.T. Club of Mexico City. Discussion evidenced much interest, particularly from those who will combine this trip to Mexico with a longer stay in southern climes. Mel Jenney discussed our 40th reunion in 1961 and plans to tie in with the centennial of M.I.T. at that time. Currently scheduled is a weekend 1921 reunion prior to Alumni Day in June, 1961. The ladies are to be invited for this momentous occasion celebrating two major events. Mel's committee will mail detailed information in coming class letters. Mich Bawden briefly sketched the successful fund raising campaign under way to enable the presentation of a substantial 40th reunion class gift to Technology. Our sights are high but not out of range. Mich congratulated his associates for their top-notch efforts to solicit generous gifts for this project. Ray St. Laurent, our class President and anchor man of the speakers, was enthusiastic about progress on all these class activities. He expressed sincere thanks to those in charge and to the prospective participants for insuring the success of our reunion in Mexico, the 40th reunion, and the class gift. Among those present were: Mich Bawden, Harold Bixby, Chick Dubé, Harry Goodman, Roy Hersum, Mel Jenney, Leo Mann, Phil Nelles, Larc Randall, Ray St. Laurent, George Schnitzler, Palmer Scott, John Sherman, Ted Steffian and Bill Wald.

A friendly letter from genial and always helpful Don Severance'38, Secretary-Treasurer of the Alumni Association, says that Robert L. Moore has been renominated for membership on the M.I.T. Corporation Visiting Committee for the Department of Economics and Social Science. Frederick W. Adams has been nominated for the Committee for the Department of Chemistry and Joseph L. Gillson for the Department of Earth Sciences. These are signal honors and well-deserved recognition of leaders in their fields.

Speaking of Bob Moore, hope you saw the September 12, 1959, issue of *Business Week*, with a cover picture of Bob and Ernie Henderson against a background of their Sheraton-Plaza. In the finance section of that issue appears a review of the success story of this pair, which we have previously run in these columns, plus a discussion of the latest activities of their world's second largest hotel chain, the Sheraton Corporation of America, under the heading of "Daring Financial Paths." It makes capital reading. Of prime importance, Ernie and Bob seem to be enjoying to the utmost every moment of their self-imposed weighty burdens.

Sumner Hayward phoned that he and Betty were Florida bound for vacationing and wanted the address of Glenn and Helen Fargo. Thanks to Herb DeStaebler's recent note, we supplied the St. Petersburg location of the Fargo Motel. Sumner also reported a chance meeting with Mich and Mrs. Bawden when he and Betty attended a wedding in Wellesley. Now comes a welcome personal note from Glenn, who reports he is president of the Fargo Company, St. Petersburg investment house. Glenn is active in the St. Petersburg Yacht Club and the Lakewood Country Club. He and Helen have three children, Glenn, Jr., Lewis, a Princeton graduate; and Virginia, who attended Rollins.

Alfred B. Quinton, Jr., Brigadier General, U.S.A., retired, of Washington, D.C., received an honorary doctorate of laws last June from Washburn University, Topeka, Kansas. James F. Curtin reports a change in his home address from Cleveland, Ohio, to P.O. Box 47, Freeport, Ohio. Albert J. Hanley is now with the General Tire and Rubber Company, Akron, Ohio, and makes his home in Cuyahoga Falls, Ohio. Commander Bernard H. Moran has left Arlington, Va., for a new home at 6 Grant Street, Natick, Mass. Isadore H. Rogovin is division manager for Columbia Pictures Corporation, Boston, Mass. New addresses have been received for the following and are available on request to your secretary: Isaac Dougherty, Palmer W. Griffith, Captain Ralph S. McDowell, Captain William J. Malone, Irving D. Marshall and Clarence S. Wentworth.

Members of fraternity reunion committees and reunion chairmen of other classes who have utilized the popular Sheldon House, Pine Orchard, Conn., will be interested in a letter from Manager Carl S. Graves, who writes that the property has been sold for conversion to a residential area and there will no longer be a Sheldon House. We have had three enjoyable reunions there and were considering the site for our 40th reunion next year until the necessity of being near Cambridge to participate in M.I.T.'s Centennial altered the plans. Carl says: "I certainly appreciated the co-operation of all the boys of the Class of 1921. Please convey my sincere best wishes to all at your next meeting." Mel Jenney's 40th reunion committee is busy totting up your promise of attendance via the recent class questionnaire and says they will have an official pronouncement for these columns next month.

"An informal 'welcome home to Holyoke' party was tendered to Albert E. Bachmann, Vice-president in charge of all five paper mills of Standard Packaging Corporation, by top executives and civic leaders of Holyoke, Mass., on September 9, 1959," notes the September 21, 1959, issue of *Paper Mill News*. Red will supervise operations of the Chemical and Fine Paper Board Divisions, formerly the Chemical and Crocker-McElwain Paper Companies; the Missisquoi Division in Sheldon Springs, Vt., and the Eastern Fine Paper and Pulp Divisions in South Brewer and Lincoln, Maine. He has spent his entire professional career in the paper business, originally with Pjepscot Paper Company, then American Writing Paper Company, Kimberly-Clark Company and Missisquoi Paper Company, of which he was president. He was national president of the Technical Association of the Pulp and Paper Industry in 1949-1950 and national president of the American Pulp and Paper Mill Superintendents Association, now the Paper Industry Management Association, in 1957-1958. His only son is also in the paper business. Ray St. Laurent, who sent us these notes, included a flyer on a management seminar in Florida which was addressed by Albert E. Bachmann, Professor of Management, University of Miami! Well, Red does have a residence in Keystone Heights, Fla., and is well qualified on the subject!

Irving H. Winslow wrote a most interesting note, saying he planned to join us for coming class affairs and we can assure him he will be most welcome. Irv is architects' representative and field superintendent on school construction for Korslun, LeNormand and Quann, Inc., Norwood, Mass., and lives at 200 Plymouth Street, Holbrook, Mass. He is the author of "A Simplified Method of Construction Cost Control," which appeared in *Engineering News Record*. He and Mrs. Winslow have a married son, Frederick, who was graduated from Union College in electrical engineering. Irv says he hasn't seen recent news of Art Brambach in these columns. This must have caused Art to write in the next day's mail and also send us a most complimentary note on these efforts in behalf of 1921. Art has been with International Business Machines for many years and is now their federal government representative in Seattle, Wash. He and Mrs. Brambach live at 12454 S. E. 25th Street, Bellevue, Wash. Vice-president of the Seattle Advertising Club and President of the Seattle Sales Executives Club, Art also keeps active at sailing, fly fishing, skiing, and mountaineering. Daughter Margaret and son Robert both attended the University of Washington, both are married and each has three children. Thanks to both of you fellows for writing.

Richmond S. Clark heads the co-ordination division of Humble Oil and Refining Company, Baytown, Texas, and is responsible for the group that plans and schedules all refining operations from procurement of raw materials to shipment of finished products. Rich writes a most welcome letter and says: "Enclosed is the questionnaire you sent. You will note that Mary Louise and I hope to attend both the reunion in Mexico and our 40th in 1961. We had a most enjoyable vacation in New England, going by plane from Houston to New York and return. Following a few days in New York City on business, we rented a car in Providence, spent several days on Cape Cod and then drove to Rockland, Maine, to spend four delightful days with Helen and Ray St. Laurent on Vinalhaven. Knowing them as you do and the perfect hosts they are, you can imagine how we hated to leave. We spent several days driving through Maine, New Hampshire, Vermont and western Massachusetts. We had to see Sturbridge Village as Mary Louise is an ardent 'museumist,' to coin a word. Another week on Cape Cod and we went back to the 'coal oil factory.' After four weeks away, it looked pretty nice to us again. We acquired our second grandson last April 1. Our son, Sandy, and his family live in Houston, about 30 miles away, where he is associated with a company dealing in sand, gravel, shell, and concrete."

Do you patronize our 1921 advertisers in The Review? Sounds like the "filler" notes in an amateur theatrical program? But we're not kidding. Consider the meaningful ads of Walter Hamburger's Fabric Research Laboratories, Inc., for research, development, and consultation in the fields of fibrous organic and related

materials; of Morris Hart's Hart Products Corporation, supplier of chemicals for every phase of textile, paper, and leather processing; of Al Wechsler's Converse Rubber Company, manufacturers of various products, whose recent full page calls attention to a record of quality craftsmanship in waterproof and canvas footwear.

It is with heartfelt sorrow that we report the death of Alexander Morrison McMorran on October 20, 1959, from an accident in his home on Georgetown Road, Boxford, Mass. On behalf of the entire Class of 1921, we extend sincerest sympathy to his family. Born in Oak Hill, New Brunswick, on March 8, 1891, Sandy prepared for Technology at Phillips Andover Academy and was graduated with us in Course II. He originally entered M.I.T. in 1915 but left to serve with the Royal Air Force in World War I. At the Institute, he was a member of Delta Upsilon, the Mechanical Engineering Society, Technique Electoral Committee, Freshman wrestling team and its captain, varsity wrestling team, and the Sophomore tug o' war team. He had been manager of the acoustical and architects service departments of Johns Manville in Boston, on the staff of W. T. Roberts, Inc., New York, and at the time of his death he was the owner, general manager and treasurer of the Iona Supply Company, Salem, Mass., distributor of household supplies. He was active in the local council of the Boy Scouts of America and had been president of the Boxford Men's Club. He was well known to all of us for his staunch love of sailing and fishing. He is survived by his wife, the former Borghild Fauchald, and a married son, Peter M. McMorran. A nephew, Philip Fauchald, attends M.I.T. in the Class of 1960. Sandy had been a faithful attender at all our reunions and had a host of friends in the Class. Irving D. Jakobson, to whom we are indebted for aid in preparing these notes, writes that he and Ruth as well as Rod Bent'19 and Mrs. Bent attended the services at the Congregational Church in Boxford. Jake adds: "Sandy and I were close friends ever since we were together in Delta Upsilon and his passing is a severe shock to me and his many friends. He was greatly beloved by all his neighbors and associates. The girl he married many years ago was one of a group of my childhood friends when we were kids together in Sunday school."

Calendar: Reunion of 1921 in Mexico City on March 10 through 13, 1960; Alumni Day on campus in Cambridge, June 13, 1960; Fortieth reunion and M.I.T. Centennial in Cambridge, June, 1961. Please return that questionnaire and say you'll be there! — CAROLE A. CLARKE, *Secretary*, Components Division, International Telephone and Telegraph Corporation, 100 Kingsland Road, Clifton, N. J.; EDWIN T. STEFFIAN, *Assistant Secretary*, Edwin T. Steffian, Architect, 11 Beacon Street, Boston 8, Mass.

'22

Your secretary has spent the last six weeks lecturing on experiences in the Soviet Union and giving Chamber of Commerce speeches on the civic and cultural advantages of Buffalo, and is now ready to resume full time in service of the Class of 1922. Letters from President Parke Appel tell of the work done by Don Carpenter in talking to class members about special gift donations for this year. He also tells of the closing of Sheldon House in Pine Orchard, presenting a new problem for our 40th reunion. Constructive suggestions will be gratefully received. Attending the October meeting of the Alumni Council with Parke were Oscar Horovitz, Yard Chittick, and Warren Ferguson.

Abbott Johnson has been nominated by the Alumni Association for the position of Alumni Member on the M.I.T. Corporation Visiting Committee for the Department of Humanities. We are glad to have such astute representation. Albert S. Rairden has been named plant manager of the Palmer (Mass.) division of Colorado Fuel and Iron Company. He will have general supervision over all operations including rod mill, spring mill, and wire rope mill. Mr. and Mrs. Rairden have lived in Warren for 13 years and have taken active part in town affairs. Samuel I. Zack, Vice-president of the engineering corporation of Gannett, Fleming, Corddry and Carpenter, has been complimented for his address on "Engineering Aspects of Financing Sewage Authority Projects," in Dallas, Texas, at the convention of the Federation of Sewage and Industrial Wastes Associations. He played an important role in planning the Harrisburg (Pa.) and other sewage treatment plants.

Donald Fell Carpenter, General Manager of Du Pont's film department, was given several pages in a recent publication of *Better Living* under the title "Government Needs Businessmen." The article is recommended not only to the members of our Class who know Don but to many other responsible citizens with ability in this time of need. The pictures and background highlights are especially well done. Ray C. Ellis, Vice-president of the International Division of Raytheon Manufacturing Company, headed a group of U.S. electronics specialists in a five-week tour of Soviet plants this summer under State Department auspices. The group took 1500 photographs and brought home over 200 samples of components. He told of the Russians' impressive incentive and bonus plans as well as estimates of future production. The *Seattle Post-Intelligencer* has dedicated an article to Horace McCurdy's collection of ship figureheads in the Museum of History and Industry. He was introduced as "a gentlemen and scholar," with some credit being given to M.I.T.

The sincere sympathy of our Class goes to the families of the members who have passed away. Those about whom we have recently heard include: Kenneth M. Vreeland, Donald S. Laughlin, Colonel Will I. Levy, Homer L. Ferguson, Jr., Robert D. Estes and Colver P. Dyer. A list of those who have moved include Miss Florence W. Stiles, North Amherst, Mass.; Colonel Ross B. Warren, Corpus Christi, Texas; and Robert P. Russell, Lisbon, N. H. — WHITWORTH FERGUSON, *Secretary*, 333 Ellicott Street, Buffalo 3, N. Y.; C. GEORGE DANDROW, *Assistant Secretary*, Johns-Manville Corporation, 22 East 40th Street, New York 16, N. Y.

'23

Your secretary needs some help in order to make the class notes interesting. Send in a short or long note concerning yourself and family — your classmates would like to keep in touch with you that way.

We are sorry to report the deaths of three members of our Class. Stanley W. Lovejoy, Course VI, died on September 24, 1959 in Hartford, Conn., at the age of 59. Stanley was a native of Haverhill, Mass., and attended the public schools in that city. He was manager of research and engineering for the cutting tool division of Pratt and Whitney Company, having been with that company since 1954. He was an authority on cutting tools and the materials used to make them, including steel, carbide, and ceramics. He was author of a textbook on tool design and application, used by General Electric Company for training. The company awarded him the Managerial Award in 1952. He also wrote a section of the *Tool Engineers Handbook*, published in 1956, along with articles in industrial trade publications. From 1923 to 1931, he was office manager of the Hood Rubber Company, Watertown, Mass., leaving this post to run the S. W. Lovejoy Company. In 1940, he joined the West Lynn Works of the General Electric Company, Lynn, Mass., serving as tool supervisor until taking the West Hartford post.

Nelson W. Burtt died on September 4, 1959, in Sharon, Mass. J. Coleman Jones died on October 10, 1959, in Portland, Ore.

The following address changes have been reported: Dr. Robert V. Burns, 902 South Greenway Drive, Coral Gables, Fla.; Dr. Malhotra Des Raj, Railway Service Commission, Churchgate, Bombay, India; Charles H. Ducote, 35 Park Avenue, New York 16, N. Y.; J. Paul Harvey, 928 Goodwin Avenue, San Jose 28, Calif.; Joseph R. A. Hobson, Jr., 1819 Grove Avenue, Richmond 20, Va.; Howard B. Keppel, Brookville Lane, Old Brookville, Glen Head, N. Y.; Elliot P. Knight, 59 High Road, Newbury, Mass.; Sutra Palasiri, 32/34 Prasnanmitr Lane, Bangkapi, Bangkok, Thailand; Reginald H. Peene, 205 Forest Hill Road, Toronto 7, Ont., Canada; Leslie W. Powers, 29 B Kenville Road, Buffalo 15, N. Y.; Percival S. Rice, 178 Commonwealth Avenue, Boston 16, Mass.; F. LaVerne Smith, 11541 Weatherby Road, Los Alamitos, Calif.; William W. Vicinus, Arthur D. Little, Inc., 35 Acorn Park, Cambridge 40, Mass.; James B. Wyman, 856½ Green Street, San Francisco 11, Calif.; Charles F. Woodbury, 825 Howard Terrace, Winter Haven, Fla. — HERBERT L. HAYDEN, *Secretary*, E. I. du Pont de Nemours and Company, Leominster, Mass.; ALBERT S. REDWAY, *Assistant Secretary*, 47 Deepwood Drive, Hamden 17, Conn.

'24

As you can well imagine, steelman Ed Hanley has been rather busy of late what with interviews, radio appearances, debat-

ing, and all that. One radio interview, after the steel strike had been going some 11 weeks, started off: "Now Mr. Hanley, I am not going to spare you at all. My first question is: When is the steel strike going to end?" Ed refused to commit himself, but did say that as far as Allegheny Ludlum was concerned, "it could end tomorrow." The debate was in Connecticut where he and a former vice-president of United Steelworkers wrestled over the problem of whether or not labor's demands are inflationary. Don't know who won, but there's no question who took which side. Ed, by the way, has added another to his list of directorships. He's now in the railroad business, a director of the Pennsylvania Railroad.

Very intriguing feature story from Chicago, "Diversey Corporation a Global Success; It's Been Cleaning Up for 36 years." Diversey is a world leader in the manufacture of detergents (and other chemical products) and what makes it of more than passing interest to us is the fact that its chairman is Herbert W. Kochs. Course XV men especially will remember Herb who was with us for three years. The origin of the name is intriguing. Long ago when the little group that formed the company was casting about for a name that would not limit them, one member looked out the window of the restaurant in which they were assembled, looked at the street sign, and said "I've got it—Diversey!" Some of you will know Diversey Avenue in Chicago. The piece concludes with a listing of company plant locations, among them France, Brazil, Hawaii, Australia, but it has never had a plant on Diversey Avenue.

Another retirement has come to our attention. After 33 years with Bakelite and Union Carbide, Preston H. Scott took a disability retirement on June 1. You will remember that last spring we had the unhappy duty of reporting the death of Mrs. Scott. Now Scottie finds there's "not too much to keep me occupied," so he has, of all things, taken up the guitar. Can't keep up with all these new guitar playing stars who come blazing across the disc jockey firmament, but expect to hear that Scottie has replaced Ricky Nelson almost any day now.

Dr. Hudson Hoagland, Executive Director of the Worcester Foundation for Experimental Biology, had a very intriguing piece in a local paper recently headed "Why I Am a Scientist." Incidentally, he didn't start out to be a scientist. He got his S.M. in '24 as a Chemical Engineer. It's a lengthy story, but here are a few interesting lines: "Science is very good fun. The rewards of discovery are emotionally deeply satisfying. Like art, science is creative. Working on the boundary between the known and the unknown and advancing the frontiers of knowledge cannot be boring."

George Holmes is a mining engineer who stayed out west where the mines are. Most of his time has been spent in Montana or Nevada, in recent years in the U. S. Bureau of Mines office in Reno. Now they've evidently decided they need George at headquarters. He's moved to Washington. Ike Lee, as previously reported, has retired and is now completing the work for his master's degree in early French literature. He's working on his thesis at the moment which is concerned with love among the early French. And, the French being what they are, especially the early ones, he's wondering how the Southern Methodist boys will react to it.

With deep regret we report the passing of three classmates. Paul Andrew Jeanne was with us for a year and got an S.M. in Electrical Engineering. He had been with Bell Labs for some time. This year he was a visiting lecturer at Cornell where, in October, he died of a heart attack. Charles H. Leonard, a graduate in Chemical Engineering, was manager and partner in the Silverton Flax Company in Oregon. He was forced to retire many years ago because of physical disability. Recently he passed on. James B. Maxwell was another chemical engineer. He had been with Standard Oil Development since 1930. In May of this year he died. To the widows of all three go the sincere sympathies of the Class.

Not a cheerful note on which to end, but that is it for this time. May the year ahead be good to you all, may it bring you peace and fulfillment. And whether or not you are retired, may it also bring you real accomplishment. — HENRY B. KANE, *Secretary*, Room 1-272, M.I.T., Cambridge 39, Mass.

'25

The first item of real importance concerns reunion plans. Dave Goldman and Ed Kussmaul agreed to serve as co-chairmen of the committee, and they will take over the job which Henry McKenna had gotten so well underway. The returns from Fred Greer's letter are most encouraging, although there are many of you whom we have not yet heard from. Won't you please take a few minutes to return the slip attached to Fred's letter, thereby giving our committeemen a clearer indication of your intentions regarding the reunion? There is little doubt you will be missing a fine time if you do not find it possible to attend. About 30 classmates have already indicated that they intend to come, most of them with their wives, so that at this early date the returns are most favorable. You will be told in later mailings just who is going to be present. A note from Coolidge Hastings speaks most favorably concerning the spot picked for the reunion, and he hopes to be able to attend for the first time since 1930. A letter from Tom Price indicates his intention of coming and, as usual, his offer to do anything he can to assist in planning the reunion.

A news clipping from the Worcester *Gazette* notes that Harold H. Belcher, who has been with the Rodney Hunt Machine Company of Orange, Mass., since 1943, as chief engineer and technical director, has been named a director and vice-president of engineering for the company.

Geoff Roberts from far away Malaya sent in a fine letter resulting from your secretary's remarks at having received a letter from Glen Bateman several months ago. It still appears that classmates in the most distant parts of the world are most willing to supply copy for the class notes. Although Geoff indicated he hoped he could get his message to Glen via The Review, I am sure many of you will be interested in a few points that he made. A few months ago, he visited Rhodesia after a lapse of about 10 years. Quoting briefly from his letter, he stated: "On our way back to Johannesburg from Victoria Falls, my wife and I spent 24 hours in Bulawayo. This town is notable amongst other things as having been my birthplace. As I left in the year 1903, and had never been back, I was rather curious to see what the place looked like. We hired a car on a Saturday afternoon, and drove out to the Matopos. This is rather a wild and forbidding looking piece of country, with many large boulders poised on top of hills. We saw a Bushman painting in a cave exactly as they are described in the museum in Livingstone — the animals drawn in much greater detail than the human beings, who are usually depicted as running wildly, with legs outstretched.

"We left the car and walked up to Rhodes' grave. Dr. Jameson and the first Prime Minister of Southern Rhodesia are also buried here. There is a memorial to a small band of 33 men, commanded, I believe, by a Major Walker. An inscription on the monument states: 'There Were No Survivors.' All perished in an encounter with the Matabele. These were brave men on this frontier, in those distant days." Geoff goes on to tell of some other interesting experiences, including a Sunday morning visit to the church in which his parents were probably married and he was christened, and tells of meeting some people who had been acquainted with his relatives. It was a most interesting letter and greatly appreciated. — F. L. FOSTER, *Secretary*, Room 5-105, M.I.T.

'26

This weekend we are sitting out a nor'easter at Pigeon Cove. The sea has been howling all night but the driving rain seems to have passed. The gulls are unusually friendly at times like this since their food supply gets cut off (the fishing boats are not around tossing fish trimmings overboard). If we step out of doors with a few scraps, dozens of gulls appear from nowhere and in the high wind they simply glide against the breeze almost at a standstill. As a matter of fact, a dispos-all is an unnecessary kitchen gadget where there are gulls — just put the scraps on the wall and let the gulls fight for them.

I'm sure a certain classmate who manufactures kitchen equipment will not agree with this philosophy. We have a letter from this classmate as a result of a note written by your secretary on the bottom of an Alumni Fund letter. Guy Frisbie writes us from Troy, Ohio: "I'm sure Chenery was glad to have your help in signing his Alumni Fund letters. My check is in the mail so you can see your efforts were not in vain. Thank you for your note regarding Fred Walch. The secretarial staff at Compagnie Hobart in Paris had a rough time trying to use an old Dewey and Almy address to find Fred but he is a well-known citizen and the mere fact that he is

now listed as 'DeWalco' didn't stop our getting together. Time was limited as it always seems to be in Paris so we promised to get together for lunch or dinner the next time. Fred looks very fit and will welcome a visit from any of his '26 friends when they are in France. Our trip was most enjoyable. Flew the 707, New York to Paris in 6 hours and 43 minutes of absolute comfort. Our new grandson and his two sisters looked good to us in Italy. My son-in-law, Stanley Martin, Jr. (M.I.T.'50), was busy getting his Italian helicopter on display at the Paris Air Show. Our return on the S.S. United States was made all the more enjoyable by galleys full of Hobart food machines and dishwashers. It was a shock to get the news from Ken Lord about Corb Hoffman."

Another classmate, Earle Lissner, has also been traveling and he mailed us a post card from Italy bearing the following message: "Alice and I are still working on the lecture project. Fifty dollars for small groups nearby, or expenses plus a small fee for distant groups. If the population ever tires of watching television with its tendencies to retrogress to 'bang-bang — you're dead,' we may make our slides, movies, and travels pay off. We covered Vallombrosa and visited Fiesole today, following Milton and Browning."

Now we must report the deaths of two classmates. The death of Professor John E. Nicholas of State College, Pa., has been reported to us by the Alumni Office — the clippings have not come through and we will have to report more fully when we receive them. A letter received by Class Agent Pink Salmon tells of the death of Tom Montgomery: "My husband, Tom Montgomery, died of a heart attack July 17, while on a vacation in Florida. He was vice-president of the Acme Sponge and Chamois Company, Inc., of Chicago; a member of the I.O.O.F. Lodge of Chagrin Falls, Ohio, and the Chamber of Commerce, also in Chagrin Falls. He is survived by me, his wife; a daughter, Mrs. Patricia Cridland of Peninsula, Ohio; and by two brothers, Dr. Hugh Montgomery, Ardmore, Pa.; and Professor Raymond B. Montgomery, Baltimore, Md. It is with a feeling of great loss that I write this letter."

Pink replied to Mrs. Montgomery for the Class as follows: "I greatly appreciate your writing to tell me about Tom. I remember him from the student days, as we were in the same course and shared the trials and tribulations of many classes. I do not, however, recall when I last saw him, whether it may have been at one of our class reunions or at an Alumni Day at Tech. I judge from the activities you mentioned that he led a full life between his family, business, and community affairs. I am certain he is affectionately remembered by many friends and acquaintances. I extend to you our deepest sympathy."

While the weather does not draw me away from writing class notes, I have so many weekend projects that I really must tear away. As you know, Rockport is an art center and one cannot come here and be exposed to so many wonderful things without trying his luck. I took a whirl at painting a few years ago and after two Saturday morning private lessons I was completely exhausted — trying to see things the experienced artist visualized with ease. I quickly decided that there was no relaxation in it for me and have been working on the fringes. I have a friend who makes silver leafed decorated gesso tables and elaborate picture frames, so I have a table and several frames in the works. Another friend is a sculptor and he recently has had some of his works reproduced in reinforced fiberglass. I cannot wait to take a crack at that, too. Last weekend I tried gold leafing and gilded a 40-inch wood eagle. I'm trying to make a duplicate of the eagle in rigid polyurethane foam — have made a rubber mold and expect to foam the first eagle this week. Don't send me any orders, though, my capacity is about two eagles a year. If it takes me as long to gild them as it did the wood eagle, it will cut my capacity in half.

How about dropping me a note about your activities? I have just noticed that this is the January issue that I'm writing (in early November). By the time this issue is published I hope we will be packing our bags for a short trip to some place that is warm. We were at Ed Wendell's'25 for dinner last evening (he lives in Rockport, too). He is leaving soon for Puerto Rico and is trying to talk us into stopping by either there or possibly in Cuba if the political mess gets straightened out a little. Does anyone have any other suggestions in that general direction? Till February — cheerio. — GEORGE WARREN SMITH, *Secretary*, c/o E. I. duPont de Nemours and Company, Inc., Room 325, 140 Federal Street, Boston 10, Mass.

'27

In early September, Frank Massa, President and Director of engineering of Massa Division, Cohu Electronics, Inc., and one of the country's pioneers in the field of electro-acoustics, was the speaker at a meeting of the Braintree, Mass., Rotary Club. Frank's plant in Hingham is one of the country's major producers of sonar transducers used in the detection of enemy submarines and also used in homing torpedoes and acoustic mines. Supplementing data previously covered in these notes, Frank Massa is the author of several textbooks, including "Applied Acoustics" and "Acoustic Design Charts" and holds more than 50 patents in the field of electro-acoustics.

We learned from a recent news release that S. S. Auchincloss, President of Tracerlab, has embarked for Europe to seek additional business in the expanding European nuclear market. Prior to his departure, Mr. Auchincloss stated: "Now that the Euratom program is well under way, there is a much larger market for both reactor monitoring and nuclear laboratory instrumentation." His first stop will be at Amsterdam, Holland, where manufacturing operations by Tracerlab's European subsidiary are getting under way. Following a series of business conferences at principal European cities, Sam will visit Tracerlab distributors in the Middle and Far East and will return to the U.S. by way of Manila and Honolulu.

Richard L. Cheney has been nominated by the Alumni Association for the position of Alumni Member on the M.I.T. Visiting Committee for Student Activity. As a matter of interest, the Corporation's Visiting Committees are usually composed of nine members: three members of the M.I.T. Corporation, three non-M.I.T. members chosen by the President, and three M.I.T. Alumni members recommended by the Alumni Association. Ordinarily the committees meet once a year. The purpose of the committee is to give the department the benefit of advice and opinions of an interested group other than those actually connected with the M.I.T. Faculty or Administration.

At the annual meeting of the American Petroleum Institute in Chicago, I was glad to see Art Connell again, and he is still vice-president of Stone and Webster Engineering Corporation. I also bumped into Howard Ferguson who jokingly accused me of having held up the news of his latest promotion with Standard Oil Company of Ohio "for competitive reasons." In checking my files I did in fact confirm that I had been advised in January 1959 that Howard had been appointed manager of wholesale and subsidiary sales and all I can do is apologize for this unintentional delay. At the above A.P.I. meeting, Howard addressed the marketing division as chairman of the Lubricants Committee.

Shell Oil Company has appointed Yours Truly as Manager, Products and Commercial Sales. — J. S. HARRIS, *Secretary*, Shell Oil Company, 50 West 50th Street, New York 20, N. Y.

'28

Jim Donovan's activities as special gifts chairman for the Class has provided this column with a number of interesting items — letters like the one following. Gordon Rogers, who is a consulting engineer in Berkeley, Calif., wrote Jim: "You ask about news of the Rogers family. Life has been very good to us. My first job after M.I.T. was with Merritt Chapman and Scott Corporation. The next eight years I spent with the Union Oil Company in refinery construction and maintenance. That took me to the end of the war and for the past 14 years I have been doing consulting work for the fire insurance companies, determining value and loss on major industrial fires, explosions, and disasters. This employment has been amazingly steady.

"Our two children are married and we are experiencing the joys of our first grandchild. Our number one hobby has been boating. Three years ago we sold our cruising sailboat and had a diesel cruiser built in Japan from American plans. It is small enough for the two of us to handle and maintain and large enough to carry us to our favorite cruising spots in Mexico and Canada. On board our 'Skookum Maru' life loses its complexities."

In a letter to the Institute Faculty dated October 15, 1959, President Stratton announced the appointment of Brigadier General Benjamin S. Kelsey, United States Air Force (Retired), as Jerome Clarke Hunsaker Professor of Aeronautical Engineering (visiting) for 1959-1960. In citing Ben's accomplishments the letter of announcement says: "General Kelsey has

been active in both commercial and military aviation since 1920. A graduate of M.I.T., he received his S.B. in Mechanical Engineering in 1928 and his S.M. in Aeronautical Engineering in 1932. He joined the United States Army Air Corps in 1929 and compiled a distinguished record in flight testing, instrument flight developments, and military operations in World War II. When he retired from active duty in 1955, General Kelsey was deputy director for Research and Development at USAF headquarters in Washington, D.C.

"General Kelsey holds the Distinguished Service Medal, Distinguished Flying Cross, Legion of Merit, and Air Medal. In 1945 he received the Octave Chanute Award of the Institute of the Aeronautical Sciences for his contributions to the field. He is a fellow of the I.A.S. and a member of the Society of Automotive Engineers. Since 1955 he has been active as an engineering consultant to a number of industrial organizations." Congratulations on your appointment, Ben, and our sincere admiration for your outstanding record of service!

George Palo is the new chief engineer of TVA. His appointment was approved by the TVA Board of Directors while he and his wife Ann were vacationing in Europe last May. George is the fifth man to hold this top engineering position since TVA was founded in 1933. Ralph Jope, in corresponding with the Palos, received notes from each of them. Ann is busy with the large house they have just bought at 8129 Chesterfield Drive, Knoxville 19, Tenn. She is already looking forward to 1963 and the 35th reunion. George wrote: "The new job is a lot of fun. Just last week, for example, I was in on the announcement of our new steam plant — it will have units of 600,000 kw capacity; looked over our new 100-foot lift lock at Wilson Dam now in its final stages before opening next month; inspected the early construction for adding new hydro units to the old Wilson power house; visited our hydraulic lab to see tests on our new dam project; received the O.K. to go ahead on a $2 million bridge; and released bids on a group of new buildings. That provides an ample variety of engineering." The Palos want you all to know that the guest rooms of their new home are made up for classmates who may be in Knoxville.

We regret to report that Joe Mulvey died on June 5 after a very short illness. The information was sent by his wife, Ann, in a note to Jim Donovan. Joe's latest achievement at Scovill Manufacturing Company, where he was assistant works manager, was the completion of a $10 million copper and brass tube mill at the new Milford, Conn., plant. The first tube was drawn on the very day that Joe predicted when ground was first broken for the plant. Harold Harrington and his wife, Alice, attended the funeral. — GEORGE I. CHATFIELD, *Secretary,* 11 Winfield Avenue, Harrison, N. Y.; WALTER J. SMITH, *Assistant Secretary,* 15 Acorn Park, Cambridge, Mass.

'29

A belated happy and prosperous New Year to all you '29ers. Here are some interesting bits gleaned at the reunion and from questionnaires that were filled out by the boys in June. Thought you would be interested. Earl and Martha Abbe, along with their family, appear to be ardent travelers. Over the years they have visited practically every state in the Union and plan a motor trip to Alaska next summer. They must be rugged as well as ardent. Earl is chief metallurgist at the Springfield (Mass.) Armory. Al Eigenbrot, who has been with M. W. Kellogg since 1931, says he does quite a lot of traveling in managing Kellogg's contracts for the Canadian organization. Al hasn't changed a bit. Herm Meissner is back at Tech as many of you know, with a full schedule of teaching and consulting activities. Herm reports finding problems in teaching equally as complicated as in industry. Wally Gale reports his hobbies are: "fewer and less strenuous each year: golf with an electric cart; fishing in someone else's boat." I must say again, as I have before, that all those who attended the reunion are indebted to Joan and Wally for being the inimitable hosts at Bald Peak. Wally and Joan live year 'round at Melvin Village and love the life there. Wally commutes between the Institute and Melvin Village on weekends. Dick Coveney is Vice-president of A. D. Little, Inc., and has been with them since 1950. Dick developed Little's business research operation and opened their New York office in 1956.

It was good to see Joe Green again after a long lapse of time. Joe is a commercial engineer with Simplex Wire and Cable Company in Cambridge. He is happy to be back in his chosen field of electrical engineering after twice breaking out of it, once into civil engineering and once into marine engineering. Hugh Hamilton is president of Eastern Air Devices, Inc., and director of several companies. Hugh reports leading an ideal life in Durham, N. H., after having moved his plant from Brooklyn, N. Y. Both Hugh and his wife Helen have traveled extensively in connection with his company's operations.

Big Ted Malmstrom reports that after many years of traveling around the world he has at last settled down in New England. To quote Ted: "Bought a house in Needham — no more roaming! Career appointment Civil Service — building flood control dams in New England — family and old friends near. Come and see us!" Len Peskin who is president of his own company, Thermal Research and Engineering Corporation, Conshohocken, Pa., has this to say: "In 1948 I founded my present company. Though small, it has grown along with our family happily and steadily over the past 10 years. Martha has worked with me from the beginning as my secretary and our operations being international have enabled us to travel abroad where we have many personal friends. We are taking great joy in seeing the development of our two boys who are both scholars, one in science, the other in economics. Our oldest is married and we look forward to our first grandchild."

John Rich, who is president of Improved Machinery, Inc., Nashua, N. H., reports: "Much travel during the years to pulp mills, mainly in the U. S., Canada, and Scandinavia. Company work getting started in plastics and viscose machinery. Have two boys now in college — no engineers. We like our small city and lake life with the usual civic activities." Norman Wickstrand, who is with the Torrington Company in Torrington, Conn., has this to say: "Since 1953 I have been a mathematician with Torrington Company, Bearing Division. I've had several articles published on bearing applications. In 1958, wrote 'History of Connecticut Chapter Appalachian Mountain Club.'" Jim Magenis, who is a captain with Pan American World Airlines, is still flying overseas and most recently the jets. Jim says: "Same ol' story as before — just flying back and forth across the Atlantic, except now I do it about twice as fast and frequently as formerly. As a captain of Pan Am's Boeing 707 jets — the finest and the fastest — I must say that life is still interesting and rewarding." Sam Shaffer, who was our most distant traveler to the reunion, is controller of the May Company in Los Angeles. Sam has been in the retail department store business, except for four years, since graduation.

Warren Walker, who is president of Graphite Metallizing Corporation has this to say: "My story has been one of those uncolored, mundane sort of experiences. I do very little traveling except on business and find that building a business takes up pretty much all of my time. I am personally much concerned with the lack of general interest in our national tax policy. Very few people have read the national budget and almost no one is interested in the effect that the steeply graduated income tax system is having on our free enterprise system. I have made some speeches on this matter but find very little interest in doing something positive." Ed Powley was New York regional manager for City Service Oil Company. Ed and Dot spent a weekend with us in Maine, and at that time Ed had been promoted and now has responsibility for the entire East Coast region. It was grand to get reacquainted after a long spell of not seeing either Ed or Dot. Murry Brimberg, who is president of Brimberg Associates in Washington, says: "The family has left science to the male member and is proceeding along cultural lines. We love residing in Washington and participate in many organizations. We would certainly like to see any '29ers visiting Washington."

Gordon Bowie, who is with the New York Telephone Company, wrote: "In business, for the last five years, I have been associated with sales, finally as general sales manager in the engineering department. I am responsible for the mechanization of clerical procedures in the upstate (N. Y.) territory. For travel we are trying to see America first and have pretty well covered the U. S. and Canada. At present we are rounding it out with a trip to the Rockies. I am just completing a term as chapter president of the Telephone Pioneers of America. In all we have found life very good." Bill Aldrich doesn't have much to say in his questionnaire, but I must say we've got to hand it to this guy for his courage and love for his family. As I think we said before, Bill took off with his five children a couple of weeks before the reunion and saw just about all the country between Montana and New Hampshire, including a good

part of the eastern Canadian provinces. The week after the reunion I bumped into Bill and his grand family in the Philadelphia airport, where Bill reported they had seen New York and Philadelphia and were heading for Baltimore and Washington before returning home. Fred Celler, who is vice-president of the Brewer-Titchener Corporation, Cortland, N. Y., has this to say: "In aviation until 1934, then really hungry and was in the import business until I entered the Navy (aviation) in early 1941. Went from lieutenant (jg) up to commander by end of the war. Saw Pacific duty from Fijis to Okinawa. For five years I did independent consulting work in Canada, Europe, and the U. S. A., with New York as my base. Left for quieter life five years ago to join 125-year-old central New York forging and stamping company. Where did the time, money, and part of original energy go?" Fred attended the M.I.T. Fiesta in Mexico City last spring along with John Wilson. Tacks Crosby, who is senior technologist for Shell Oil Company, says: "Have been with Shell Oil Company since leaving Tech. Went on two foreign assignments to Holland, England, and France."

A note in the local press announced that Professor Chaim Pekeris visited Tech last fall. Chaim is the head of the applied mathematics department of Weizmann Institute of Applied Science in Rehovoth, Israel. A note from Frank Pierson to Frank Mead from Charlotte, N. C., tells that Frank has changed his company affiliation and is now industrial engineering consultant with Celanese Corporation in Charlotte. Frank also reports the marriage of his daughter Peggy to William M. Howard, Jr., on June 20. — FISHER HILLS, *Assistant Secretary,* 62 Whittemore Avenue, Cambridge 40, Mass.

'31

If there is truth in the old adage "No news is good news," our Class has been highly successful during the past month. The only word concerning the activities of members of our Class was received from that old reliable, the Alumni Association, who furnished the following new addresses: Vice Admiral Clarence E. Ekstrom, Com. N. A. S., U. S. P. F., U. S. N. A. S., North Island, San Diego 35, Calif.; Colonel Fred J. Elser, 13950 Sherman Way, Van Nuys, Calif.; Robert D. Knight, American Steel and Wire Company, Rockefeller Plaza, Cleveland 13, Ohio; Alvino Manzanilla-Arce, Angel Urraza #1311, Mexico 12, D. F. Mexico; Robert R. Moffat, Shore and Moffat, 51 Wellington Street, W., Toronto 1, Ontario, Canada; and Arthur C. Rubey, Jr., P. O. Box 3, West End Station, Colorado Springs, Colo. — EDWIN S. WORDEN, *Secretary,* 9 Murvon, Ct., Westport, Conn.; GORDON SPEEDIE, *Assistant Secretary,* 90 Falmouth Road, Arlington 74, Mass.

'33

Happy New Year from all your class officers, and may the coming months bring the inner satisfactions which come from reflections on the past and contemplation of the future. Perhaps only the rare individual can look back with complete assurance that all went as hoped for, but all can look forward with confidence and zeal, acknowledging that the best laid plans run afoul of unforeseen practicalities. Now, what gave rise to this outburst of philosophy? Well, here we are extending seasons' greetings when the leaves are still where nature put them; similarly we offer best wishes for a pleasant summer while the last snow of winter casts a damp and belligerent shadow across the hopeful and warm spring sun. Writing class notes for all class secretaries was ever thus, printing schedules being what they seem to have to be. Putting this in a more humorous and less philosophical vein, every class secretary comes face to face once a month with the kindly advice on the familiar sign "Plan Ahead."

As an experiment, the Alumni Association last fall held an Alumni Officers' Conference in Chicago — as well as in Cambridge. As part of the road show, yours truly had the good fortune to wine and dine several times with Ellis Littmann and Cal Mohr. Both were in fine fettle. Ellis, with both feet on the ground and mind working on all eight cylinders, has extended his business enterprise beyond the bounds of Missouri; may his new venture in Iowa be only the beginning. And if you know of any orphan company in the metal fabricating business that needs a parent, just get in touch with him. (Ellis is unaware of this suggestion.) As for Cal Mohr, no class ever had a more conscientious reporter and correspondent. Cal attends every important professional meeting within shooting distance of his home base and has an eagle eye for the '33ers. In the early fall, Cal called on Sam Hopper, VII, while he was in Indianapolis and learned that Sam was about to leave for Washington, was later scheduled to spend a week on the Medical Education for National Defense Tour and that Sam is a national officer of the American Public Health Society. Sam's older boy is a freshman at DePauw and his younger son is a freshman in high school.

Ed Rowell stopped by in Cambridge in late October by way of Saudi Arabia. Ed has been intimately involved in the practical problems of an American company operating in a foreign country, where the officials of the local regime smell the value of the dollar in every gallon of oil pumped to the surface. Ed looks well despite the problems inherent in his foreign assignment.

Frank Heselton's son, Frank R., Jr., is in the Freshman class at M.I.T. We've not heard of others yet. Frank writes that: "at the biennial national convention of the National Federation of Federal Employees a year ago, I was elected as one of the national vice-presidents of that organization. I suspect that it may be somewhat unusual to find a union officer among M.I.T. graduates, and some may consider it to be a dubious honor. In justice to our classmates, I should perhaps explain that the National Federation of Federal Employees is independent of any other union and operates with objectives and by methods quite different from those commonly associated with labor unions. It has a membership of over 100,000 federal government employees, including the full range of civil service positions other than those in the post office department; with members in every state in the Union (including Alaska and Hawaii), most of the overseas possessions and many foreign countries where there are U.S. installations. As the largest and oldest organization of government employees the N.F.F.E. has been largely responsible for keeping the conditions of government employment somewhat comparable with those of private employment, and has made major contributions to improvement of procedures and effecting of economies in the operation of the government." Frank also writes that he plans to spend a couple of weeks schooling at Fort McClellan, Ala.

Every class has one or two men who really turn the crank and make things go at the appropriate time. One of those in '33, — and a standout he is — is Ed Goodridge, who, among other things, masterminded the 25-year reunion record and operated with imagination behind the scenes to keep the reunion itself moving in a positive, constructive direction. Ed was featured in the October newsletter of the M.I.T. Club of New York for chairing the Westchester fall meeting as V.P. of the Westchester region. We'll bet the meeting was a huge success. Another equally distinguished member of the Class, Garb Garbarino, is the V.P. of the M.I.T. Club of New York and served as chairman of the fall technical seminar on atomic waste disposal. Garb and Ed are in the same league.

In reviewing the fall newsletter of the New York Club, your secretary finds himself credited as the author of a chapter in "the book you've been waiting for" — *Notes on Operations Research 1959.* Flattering, but completely erroneous; any comments your secretary might have on operations research would have no professional validity and would scarcely be "what you've been waiting for." Sorry to disappoint you. Operations research just isn't for me!

On the move — and let's hear from you so your fellow classmates may have the whole story: Fred Aldridge, XI, from San Francisco to Bethesda, Md.; Fred Kressman, X, from Laurel, Miss., to Shamrock, Fla.; Ed Ragsdale, XIII-A, from Detroit to New York City.

Back to the inner satisfactions for a moment. Surely you have been through that familiar mental exercise recently of "where have I been, where am I, and where am I going." How about jotting down a few comments on this theme, of interest to the Class. If this strikes you as an appeal for what The Review editor calls "feedback," it is, man — it sure is! — R. M. KIMBALL, *Secretary,* Room 3-234, M.I.T., Cambridge 39, Mass.

'34

First and foremost let me report the pleasant news of the action taken at the recent Alumni Officers' Conference in Cambridge when the Bronze Beaver Award was presented to Henry B. Backenstoss, President of the Class of 1934.

These awards are made biennially to Alumni who have made significant contributions to the Institute's welfare in more than one area of endeavor. Hank was cited as follows: "As president of his Class and reunion gift chairman, his devoted and effective leadership over a period of five years, resulted in the largest 25-year gift ever made by any class." Those of us who worked with him are especially cheered by this well placed personal recognition. Hank was unfortunately unable to receive the award in person because of his new undertakings in the field of pedagogy at the American University in Beirut, Lebanon. It was, and is, Hank's feeling that the results of our five-year class giving should be a source of pride for every class member regardless of the amount of individual participation. To be sure, we have set an amazing new record, but, in this case, let us hope that the challenge will be forcefully and successfully met by other classes, with new records to follow in increasing number.

Have you ever been in the Oyster Bar at Grand Central Terminal in New York City at 11:00 P.M. on a Tuesday night? It's rather a silly place to be unless, of course, you happen to crave a few oysters and also happen to be in the neighborhood. That was precisely my situation on October 13. While sitting in contentment and gastronomic satiety, a clap on the back brought me up standing face to face with E. Philip Kron. Phil was in the big city on business, too, and had an associate from Eastman Kodak with him. There being no other pressing business to be dealt with at that moment, Phil led the group to an elegant midtown bistro called "The Bird n' Glass" for a brief reunion and some impromptu singing. Yes, we did a turn or two on some Tech songs under the direction of a superannuated but charming piano player who surprisingly sang right along with us on "Take me Back to Tech," words and all. Phil himself is much too active to permit a competent word picture to be drawn in these few lines. Let me just say his family is well. The oldest of their three children (all boys) is a senior at Dartmouth. As assistant director of purchasing for Eastman, Phil leads a busy life including much traveling on purchasing contracts and giving talks. His extra-curricular activities are varied and include work on the school board, church affairs, Scouting and the M.I.T. Club of Rochester, of which he is president. Perhaps the brightest gleam came to his eyes in telling about his recent acquisition of some lakefront property which he plans to use assiduously for the pleasure of his family and friends.

Jack Chesterman, a Cource VI graduate, broke into print recently with an article describing his company's efforts to meet the problem of sorting business data when it must be accumulated from (and perhaps distributed to) millions of pieces of paper. Jack, who was among those at our class reunion last June, has been in telephone company work since graduation and is now in the systems engineering department of the Bell Telephone Laboratories, Inc., at Murray Hill, N. J. His article describes vividly some of the tremendous problems in accumulating data regarding telephone calls and charges and shows how electronic machines are being successfully applied.

J. E. Everett of Skokie, Ill., was reported in the *Wall Street Journal* to have developed his Dynapar Corporation, which makes automation controls, to the point where results are beginning to show after a three-year struggle. He says: "It has been tougher than I thought. I could still go broke. I might lose my health. I have to sacrifice time from my family. But, I'm willing to take the risks. There is a lot of satisfaction in it." Also, in the line of new developments, a course in the Direct Conversion of Heat to Electricity was given at the Institute this past summer. Anyone needing some help or advice on this subject might get in touch with our classmate, Professor Joseph Kaye, who was one of the teachers of the course.

Many thanks to Walt McKay for letting us "peek over his shoulder" at a letter to him from Ken Lippitt who recently started working in the Microwave Laboratory at Hughes in Culver City, Calif. His new permanent home address is 1127 Longfellow Drive, Manhattan Beach, Calif., "a large house on a large lot with a beautiful ocean view." Ken is happy to consider his new address as permanent after finding his new job to be most attractive and especially after undergoing the rigors of transcontinental housemoving.

A brief sojourn at Redington Beach, Fla., in November provided the opportunity for contact with Bill Mills and a full, pleasant evening of conversation and reminiscences. If any of you experienced a burning sensation in the ears along about that time, it was probably one of us just saying, "Do you remember the time that — etc., etc., . . ." Bill is another one who has a host of outside interests and civic responsibilities but still is very much in charge of his aggressive contracting business. Bill's oldest youngster, Bill, Jr., is a junior at the University of Florida. Their three daughters, 13, 10, and 9 years old, are preoccupied with horses, especially since Bill has purchased a 30-acre tract and set up a stable and riding academy right in St. Petersburg not far from their home.

Bill has always maintained close association with M.I.T. in educational council work and otherwise. He has now been appointed to the Course I Visiting Committee, an assignment which he accepted with enthusiasm. Business and personal complications prevented Bill and Caroline from attending the reunion last June but they indicated that the 30th would get top preference on their 1964 calendar.

I have now been living in Huntington, W. Va., for over 23 years and truly feel like an adopted son of the "mountain state." Both of our children are hillbillies, for sure. Phil, 18, is a freshman at Case Institute of Technology (where John Hrones presides over the academic affairs) and above all else enjoys singing and playing his guitar (gittar). Kay, 13, is a ninth-grader. One of our biggest problems is keeping shoes on her. Aside from some complaints about damp winter weather, we find this area a most attractive and hospitable place to live. I have been with the International Nickel Company plant here for the entire 23 years, and for the past few years have been assistant general manager. It is with much personal regret that my assignments have taken me progressively away from the technical details of metallurgy and into that fluid state of "learning less and less about more and more" which, I am told, frequently leads to "knowing virtually nothing about everything." However, there is never a dull moment in this heavy-industry operation involving 2500 souls who are struggling to convert some 50 different nickel alloy compositions into almost any conceivable form or shape a customer might wish. The division of the company which includes our plant is currently reorganizing in order to meet the anticipated future needs of customers for nickel alloys and technical services. Among my current assignments of special interest are some revised accounting practices and the installation of a high-speed, electronic, data-processing system. On the latter point, perhaps I shall have some additional comments in a later issue, since most of our experiences are still ahead of us.

Now that we have four class secretaries, it is a sincere hope that we have increased the probable incidence of having class members inspired to drop one of us a letter. How about providing support for this hope? Even a very brief note or a post card will be helpful in keeping our class notes of broad interest. — G. K. CROSBY, *Secretary*, Longwood Road, Huntington, W. Va.; other *Secretaries*, H. E. THAYER, 415 West Jackson Road, Webster Grove 19, Mo.; M. S. STEVENS, Room 1-139, M.I.T., Cambridge 39, Mass.; J. P. EDER, 1 Lockwood Road, Riverside, Conn.

'35

The first meeting of the committee for our 25th reunion was held on October 28 at the Faculty Club. The following classmates were present and were assigned to sub-committees: class book — H. Dow, A. Marquardt, C. Rucker; mailing and publicity — R. Antonsen, W. Stockmayer; local arrangements — P. Smith; and Treasurer — J. Hossfeld. As you know, Walter Stockmayer is chairman of the 25th reunion committee. It was decided to follow recent practices and have the reunion at M.I.T. By the time you read this, the first announcement and questionnaire will be in your hands. Please fill out the material and make your plans *now* to attend. The following people have agreed to work on the committee: I. Banquer, L. Beckwith, B. Blocker, A. Cohen, G. Golden, R. Granberg, R. Lawrence, A. Mowatt, J. Taplin, F. Travers, and yours truly.

If you have not sent in your contribution to the class gift, do so now. The committees throughout the country have been doing a wonderful job and it looks as if we will be able to present M.I.T. with a gift of which we can all be proud. Leo Beckwith's Greater Boston group set a goal of $25,000 of new donations and at this time it looks as if the goal will be reached as we already have received several large gifts or pledges. Please join the

bandwagon. — FRANCIS W. MULDOWNEY, JR., *Secretary*, 1109 Boylston Street, Chestnut Hill 67, Mass.

'37

Phil Peters reports that he had a pleasant evening recently with Art Zimmerman when they both were over at M.I.T. at the Alumni Officers' Conference. Art is as busy as ever with his sales management responsibilities at the Steel Improvement and Forge Company in Cleveland. He's also up to his neck in community affairs, among other things being chairman of the board of trustees at his Congregational Church in Shaker Heights. Phil also tells that there are four members of the Class of 1937 on the Alumni Council this year. They are Ralph Webster, Tom Kinraide, Bob Thorson, and Phil himself. This year Phil is serving as a member of the executive committee of the Alumni Association and has the job of running the 1960 Alumni Day as chairman of that occasion. He says that he is hoping that there will be a sizable turnout of '37 representatives on June 13, 1960, since he and his committee are laboring mightily to make the day an outstanding one.

Dick Fowler has just been appointed instructor of medicine at the George Washington University. Louis Bloom has been transferred to the General Electric atomic power equipment department, San Jose, Calif. He is working as a buyer in the purchasing department. The Blooms, Louis, and Grace, and their two children have just moved to 2414 Beechwood Avenue, San Jose 28, Calif. Phil Bliss is in charge of instrumentation for Pratt and Whitney's nuclear engine project. John Fellouris has his own general construction outfit which does mainly building work, commercial, industrial, institutional, and some residential. John and Gioconda announced the arrival of a baby girl on May 21, 1958. Congratulations from all of us.

Charles Dodge is working at the Stanley Aviation Corporation, Denver, Colo. The Dodges, Charles, Eleanor, and their three children, are now living at 13120 West 21st Avenue, Golden, Colo. Ed Bartholomew reports that he and Sara had a pleasant vacation this summer in southern France and the Italian Alps. Dave Fulton, General Manager for Chemical Construction Corporation, has been appointed Vice-president, responsible for world-wide sales of the firm. A wholly owned subsidiary of Electric Bond and Share Company, Chemico is a major designer and builder of chemical plants. Dave has been general sales manager since 1958. — ROBERT H. THORSON, *Secretary*, 506 Riverside Avenue, Medford, Mass.; CURTIS POWELL, *Assistant Secretary*, Room 5-323, M.I.T., Cambridge, Mass.; JEROME SALNY, *Assistant Secretary*, Egbert Hill, Morristown, N. J.

'39

Regretfully, here's another sad note about a classmate. Andy Fogliano died of a heart attack in June. Word came by way of Paul Sandorf, who teaches at M.I.T. and who recently saw Mrs. Fogliano. No further details are on hand. (Incidentally, Paul's address is 21 Tyler Road, Lexington, Mass.)

The October 1 class agent's letter elicited this bit of news from Lawrence Lyons: "I learned when I was transferred from California that I am a 'towney' since I do not commute to New York. The Norwalk headquarters of the Burndy Corporation is my permanent location as the production manager of the utility-industrial division. At the moment, I am temporarily at our North Haven (Conn.) plant, breaking in a new manager." Larry gave his home address as 41 High Point Road, Westport, Conn. I'm glad our letter drew this one news item; let's have more, and tell us what you're doing. You enjoy reading about friends, but we've got to have the material first so that it can get into these notes!

How many of you saw the recent issue of *Business Week* with Dick Leghorn's picture on the cover? It was a real treat to see his still-youthful face there, with a group of his Itek officers. The article did a good job in relating some of the facts concerning Dick's success with this spectacular new company. The name "Itek," in case you are wondering, is derived from "information technology." As if to follow up on the McGraw-Hill magazine article, an October 21 news release added more: "Confirmation of awards and initial funding of more than $12,000,000 worth of contract proposals have been received by Itek Corporation, Richard S. Leghorn, President of Itek, announced today. One of the larger contracts calls for the development and manufacture of special equipment for the nation's space program. The other contracts represent a continuance of Itek's efforts in the areas of optics, electronics, mechanical design, fabrication, and testing of graphic information handling systems, begun previously under long-term Air Force research and development contracts.

"In addition to its Information Technology Center in Boston, Itek also operates two aero-space technology facilities in Palo Alto, Calif. These are Itek Palo Alto and Vidya, Inc."—OSWALD STEWART, *Assistant Secretary*, 31 Birch Road, Darien, Conn.

'40

John Hollomon has been elected a fellow of the American Academy of Arts and Sciences. Theodore Thomas has been promoted to department chief in material handling and packaging engineering at the Merrimack Valley Works of the Western Electric Company. John Halford has been appointed assistant director of research at American Optical Company. Previously, John had been vice-president and assistant treasurer of the Brunswick Worsted Mills.

Robert Dorsey, who was with General Electric in Cleveland, has been elected a fellow of the Illuminating Engineering Society due to his contributions in the field of the development of light sources. Schrade Radtke, who is director of the American Zinc Institute Research Program, was the concluding speaker at the Zinc Institute Plating Symposium held in New York on October 22, 1959. At the fall meeting at the Institute to aid the Alumni Fund Drive, we were represented by Harry Sedgwick, John Vanderpoel, Phil Stoddard, Jack Danforth and Sam Goldblith.

Tom Creamer has been nominated by the Alumni Association for the position of Alumni Member of the M.I.T. Corporation's Visiting Committee on Student Activity. The function of this committee is to give the Tech students the benefit of advice and opinions of an interested group other than those actually connected with the M.I.T. Faculty or Administration.

As this is our 20th year out, an extra effort should be made for our Class to have a good record in the Alumni Fund drive. Due to a misunderstanding, the reunion in June will not be held at Snow Inn. As soon as a new meeting place has been decided upon, the details for the reunion will be published in this column. — ALVIN GUTTAG, *Secretary*, Cushman, Darby and Cushman, American Security Building, Washington 5, D.C.; SAMUEL A. GOLDBLITH, *Assistant Secretary*, Department of Food Technology, M.I.T., Cambridge, Mass.; MARSHALL D. MCCUEN, *Assistant Secretary*, 4414 Broadway, Indianapolis 5, Ind.

'41

Basil Staros has been promoted to engineering department head for preliminary design in Sperry's air armament division. He will be responsible for predicting future weapon system requirements, generating new systems to meet these requirements, and analyzing the feasibility of advanced concepts. Joining Sperry in 1951, Basil was made group leader for aerodynamics and flight test analysis of the Sparrow I missile. In 1952, he advanced to senior project engineer, and then to research engineer the following year. In 1954, he became engineering section head for system analysis in the weapon system engineering department. Basil holds a master's degree in aeronautical engineering and the degree of aeronautical engineer, both from the California Institute of Technology.

Austin Fisher has been appointed vice-president and director of research for Ludlow Papers, Inc., Needham Heights, Mass. He will be responsible for research and development of all Ludlow products in both the fine papers and the industrial papers divisions, which include gummed label papers, specialty coated papers, industrial packaging papers, and sealing tapes. For the past 13 years, Dr. Fisher has been with Arthur D. Little, Inc., in Cambridge.

The following men have been nominated by the Alumni Association for the position of Alumni member on the M.I.T. Corporation Visiting Committees: Joe Bowman for the Department of Earth Sciences, and Nathaniel Rochester for the Department of Modern Languages. Bob Sinsheimer and Herman Affel have been renominated to the committees for the

Departments of Biology and Physics, respectively. The Corporation's Visiting Committees are usually composed of nine members: three members of the Corporation, three Alumni recommended by the Alumni Association, and three non-M.I.T. members chosen by the President. The purpose of these committees is to give the departments the benefit of the advice and opinions of an interested group that is not connected with the Faculty or the Administration of the Institute. George Clark, of Sylvania Electric's Lighting Department in Wheeling, W. Va., has been named a fellow of the Illuminating Engineering Society, for valuable contributions to design and application of lighting equipment.

Paul Cushman's daughter Laura is enrolled as a freshman at Alfred (New York) University this year. Paul is a member of the advanced engineering group of the General Electric Ordnance Department in Pittsfield, Mass. — IVOR W. COLLINS, *Secretary*, 9 Sunnyside Drive, Dalton, Mass.; HENRY AVERY, *Assistant Secretary*, Pittsburgh Coke and Chemical Company, Grant Building, Pittsburgh 19, Pa.

'42

Many of you, I am sure, have participated in special gifts and regional Alumni Fund solicitations; and in the course of such visits have had the same rewarding experience I recently did. It is always nice to visit old friends and to talk about many subjects, M.I.T. and otherwise, while warming up to the financial project at hand. It is equally pleasant to call on a very casual acquaintance and find that you have many interests in common. On just such a visit I had a long and intriguing conversation with Dr. Henry A. Hill. Henry took his Ph.D. in Chemistry with us and probably is known to more '40 and '41 men than he is to our classmates. This occasion took me out to Wilmington, Mass., where Henry is vice-president and director of research, development, and engineering for National Polychemicals, Inc. His firm manufactures products primarily for the rubber and plastics industries including: nitrogen releasing blowing agents used to produce closed cell rubber and foamed plastics; accelerators and special activating plasticizers for rubber; silicone emulsions used as mold release agents for rubber; ester plasticizers for polyvinyl chloride resins, magnesium oxides, and specialty organic chemicals used as additives for soap and detergents. I also learned that alumni funds are a major activity in the Hill household. Between himself and his wife, he enthusiastically supports five institutions of higher learning, for his wife has degrees from three colleges and universities. Our best wishes to Henry and to his youngsters who themselves will be entering college in the near future.

The Portsmouth Naval Shipyard has announced the selection of Warren C. Galle to head the design division's new computer application and programming branch. This branch has been established to solve design engineering problems utilizing electronic computers and to provide services to other shipyard departments concerned with computer applications in the engineering field. In addition to his work at the Institute, Warren studied naval architecture at Webb Institute in New York. During World War II he was a Navy officer serving as ship superintendent at Portsmouth and then at Pearl Harbor. He has been associated with the Portsmouth Yard as a naval architect since 1946.

Louis A. Arnold has been chairman of the industrial division of the Nashua, N.H., Community Chest drive. Lou has been active in many previous Alumni Fund as well as Community Chest drives. He is also a past president of the Nashua Industrial Management Club, program chairman of the 1958 N.H. Industrial Conference Committee, a member of the Rising Sun Lodge of the Masonic Order and of the Membership Committee of the Nashua YMCA. During working hours he is a development engineer with Sprague Electric Company. Lou and Marguerite have two daughters, Jane and Ruth.

The last financial report to the Class was in May 1958. At that time we had $202.20. Interest and incidental income has added $30.73 to bring the total on hand in the bank to $232.93.

"Doctor," has been added to the record of Carl A. Gagliardi, now of Dearborn, Mich. The long distance move of the month was by Manuel Lukoff — from Arlington, Mass., to Hollywood, Calif. Other changes of state were by: Ernest F. Artz to Sanborn, N.Y.; Russell J. Estelle, Jr., to Pennsgrove, N.J.; Albert E. Hayes, Jr., to Redwood City, Calif.; Howard D. Hoffman to Cincinnati; Commander Donald H. Kern to Gales Ferry, Conn.; and Warren S. Loud to Madison, Wis.

It occurs to us that there must be around 200 regular readers of this column. At least half of you, by blackboard estimate, have been chronicled, or at least mentioned in these lines during the past seven years. To the others and their closest friends, our apologies and a suggestion: if by now you have not thrown out your collection of Christmas cards, please look through them for the news from far-flung classmates. We have no objection if you scissor out all of the personal notes and send us the remains of the cards for incorporation herein. While we have not indexed the news items already recorded we shall undertake to edit out almost all of the duplicate material that comes in.

Best wishes for a good heating and hot buttered rum season to you all from — J. J. QUINN in Hawthorne, ED EDMUNDS in Albuquerque, BOB KEATING in East Alton, and LOU ROSENBLUM at Tech/ops, Burlington, Mass.

'43

On August 8, 1959, Peter W. Forsbergh, Jr., and Mary Ames Russell were married at the Community Church in Dublin, N. H. Mrs. Forsbergh attended Stanford University and Wellesley College; Pete, who is a Course VIII classmate, got his Ph.D. in Physics from Tech in 1949, and is a research physicist. Gil Monet's wife, Marion, who received her master's degree with our Class, has joined the faculty of the Tower Hill School in Wilmington, Del., as an assistant in the library.

Classmates on the move include Bill Kates, from Hempstead, N. Y., to Fall River, Mass.; Lieutenant Commander John Watts from Arlington, Va., to San Francisco; Dick Barry from Lynchburg, Va., to Wayne, Pa.; Bedrich Hettich from Colorado to Food Machinery and Chemical Corporation in New York; and Leonard Croan from Natick, Mass., to the Pentagon. Word has it that Frank Swenson, who, as you know, is an M.D. now, has switched from obstetrics to radiology. The change has something to do with the night work involved in the former calling. Seems that about half of all births occur at night. Well, we certainly wish Frank continued good luck with his career.

Your secretaries are collecting letters from classmates as a new hobby; if you believe in us, clap your hands, or send in some news. Otherwise, our lights will go out. — RICHARD M. FEINGOLD, *Secretary*, 10 North Main Street, West Hartford 7, Conn.; *Assistant Secretaries:* CHRISTIAN J. MATTHEW, Arthur D. Little, Inc., 314 Battery Street, San Francisco, Calif.; JOHN W. MCDONOUGH, JR., R.R. #1, Donwood Drive, Naperville, Ill.

2–'44

This will be the first article on class doings in the New Year. It will also be the beginning of getting the information from current news rather than the reunion. It was fun while it lasted, but the mail also has some very interesting bits of information to report.

Henry F. Ivey, who is with Westinghouse Research Department in Bloomfield, N. J., co-authored an article in the Westinghouse *Engineer* on electroluminescent phosphors, and a report from the Illuminating Engineering Society advises that Henry gave a paper to the Society recently in San Francisco on the same subject.

Several recent address changes look very promising. Joseph L. Ullman has moved from Buffalo, and has joined the staff at University of Michigan in Ann Arbor. Richard V. Mullikin, who was with DuPont in Wilmington, Del., is now in La Marque, Texas. Unfortunately, the report doesn't clue me in on his new position. Edward B. Walker, who was down in Barcelona, Venezuela, has moved to Deadwood, S.D. Sure would like to know what the attraction is in Deadwood! And a short hop was made recently by Carl Lindemann, Jr., who moved from Riverside, Conn., to Old Greenwich, Conn. I suspect the commuting is better, though I would like a note from Carl to give the information to the rest of the Class. Caleb Massee, who was in Chicago, has moved to Orange Park, Fla. Since we are looking for the first snow flurry in Boston any day now, your move sounds like it would be particularly pleasant at this time of year, Caleb. A note received from Si Bessen advises of the arrival of another boy and also that the Bessen's address is 2650 South Bentley Avenue, Los Angeles 64, Calif. A note indicates that Dick Vail has moved from San Lorenzo, Calif., to Manhattan Beach, Calif. Marvin Epstein

has moved from St. Louis to Morristown, N. J. John T. Gilfillan, Jr., has just earned the title of Dr., and moved from Albuquerque, N. M., to Los Angeles, Calif. Al Picardi moved from Toledo to Northbrook, Ill., and George Fotieo with Martin Company in Baltimore was transferred down to their Orlando operation in Florida. Dick Baendle, who was in New York City, has become a suburbanite and moved to 112 Fish Hawk Drive in Middletown, N. J. To all of you who have moved, very best of luck. If anyone wants addresses of the fellows who have moved, your secretary can supply same.

A publicity release from United Research, Inc., advises that Bob Plachta has joined them as director of administration. There is a Course XV man staying in his own field! Morgan Construction of Worcester, Mass., advises that Warren H. Howard has been appointed their Pittsburgh managing representative. Next time you get East, Warren, how about bringing your class notes secretary up to date? A note advises that Jim B. Weaver has been appointed director, new development appraisal department of Atlas Powder Company. — PAUL M. HEILMAN, *Acting Secretary,* 66 Central Street, Wellesley, Mass.

'45

A most happy and prosperous Reunion Year to you all. To those of you who promptly acknowledged your officers' and reunion committee's appeal for class dues, our most grateful thanks; to those of you who have forgotten or overlooked this necessity, we trust this brief word will serve as a necessary reminder. If your class treasury were able to speak it might aptly say that it is no sin to be poor, but it is most inconvenient. Let us not be too inconvenient!

Although you will not be receiving your first official 15th reunion flyer for another week or so, your reunion committee has already received several firm reservations. Vince Butler received his November issue of The Review on October 28 and he telephoned at 3:30 A.M. October 29 to confirm his reservation. Your secretary appreciated his promptness although I could have waited another four hours for the news. Since Bobbie will be resting about that time, Vince's better half must wait another five years to meet many of you guys and girls.

As these notes are being written on November 11 and our first full scale committee meeting is not until November 24, it is impossible for me to outline any further reunion plans at this moment; I shall report regularly during the spring months the names of those classmates definitely planning to attend the 15th reunion of 1945.

This season you appear to be slow in getting your names in the news for we have very few address changes or press releases. Bill Blitzer received modest headlines in the San Francisco papers as the local press summarized a few of Bill's statements on how home lighting could affect the way one might feel, taken from a talk he gave before the national conference of the Illuminating Engineering Society. In between trips to Europe and the normal local community duties, not to mention M.I.T. activities, Prexy Dave Trageser presented a paper on the High Voltage Engineering Corporation's research program, which aims at lower radiation costs, at an early fall Industrial Nuclear Technology Conference in Chicago. John E. Plantinga of Old Greenwich, Conn., has recently become a partner in the firm of Meyer, Strong and Jones, consulting engineers in New York. Lieutenant Samuel Moore is now in charge of the U. S. Coast Guard Merchant Marine detail in Antwerp, Belgium. John Vozella has forsaken the wilds of Maine having just moved to Reading, Mass. Chuck Buik, who we trust will be at our reunion, has moved to Essex Junction, Vt. At least I can find this Vermont community on the map which is more than I can say for Charlotte, Vt.

Please keep me happy! I enjoy writing these class notes but I do need news about you and your family to continue my enjoyment. — C. H. SPRINGER, *Secretary,* 420 Lexington Avenue, New York, N. Y.

'46

Happy New Year. We hope everyone enjoyed a Merry Christmas and we further hope that this year's problems will turn out to be no worse than last year's. William S. Gale's problems are all over. Bill was married last September to the former Jean Rudman of Brookline, Mass., and after a honeymoon in Mexico they returned to 55 Harvard Avenue, Brookline, to make their home. Bill was formerly with the McCord Corporation in Detroit, but now is chief engineer at Gillette and Company in Boston. Shepard M. Arkin has been named to the newly created post of marketing manager for the missile systems division of Raytheon Company. Most recently he has been manager of the division's Sparrow III program, having joined the firm in 1956 as a staff engineer working on the air-to-air Navy missile. Prior to joining Raytheon he held, for five years, both technical and administrative posts in the Navy Bureau of Aeronautics' air-launched missile program. He also served as senior Navy member on joint Navy-Air Force-Atomic Energy Commission study programs. After receiving his B.S. in 1946 he took his M.S. in 1947. Shepard is a member of the Institute of the Aeronautical Sciences, American Rocket Society, American Management Association and Sigma Xi. The Arkins and their two children live at 25 Whipple Road, Lexington, Mass.

Received a very fine letter from Lewis T. Mann, Jr. Lewis was a chemistry major at M.I.T. and after graduation went to Columbia for his M.A. and then Ph.D. in 1951. He was with Riker Laboratories in Los Angeles until 1953 and then had a stint in the Army, emerging in 1956 to accept a research fellowship at Harvard Medical School. His work initially was in research on cold and freezing injury to animal tissue. Now he is doing research in the chemical nature of the antigenic substance in homotransplantation immunity. Despite the Danish implications in the above, Lewis insists his work has nothng to do with the third sex. His first journal article on his work is to be published soon in *Science.* Lewis was married in 1957 and now makes his home at 161 Clark Road, Brookline 46, Mass. In July, 1959, he was promoted to research associate at Harvard Medical. Lewis is a captain, Medical Service Corps, U.S. Army Reserve, and gets back to M.I.T. every week to drill as a member of the 1001st Army Research and Development Unit.

Thanks very much for your letter, Dr. Mann. I hope others in our Class will favor us with letters as interesting and informative as yours. Until next month then — JOHN A. MAYNARD, *Secretary,* 15 Cabot Street, Winchester, Mass.

'48

Several '48ers participate in a service activity that we seldom hear about, or read about. Although, little publicized, their efforts are important to the country, to M.I.T., and to high school students. These classmates have volunteered to serve as educational counselors. So that we might all learn more about the activities of educational counselors in general, and '48 counselors in particular, we solicited brief statements.

Arnold M. Singer wrote: "I became interested in the Educational Council several years ago as I became involved in the operations of the Houston Public School System. As the father of three daughters (no candidates for M.I.T.) with two already in grade school, it has been gratifying to see the tremendous increase in quality of the schools to which I am sending my children. Last year I interviewed a dozen candidates for M.I.T., of whom six were accepted. Three of these elected to go and are now in the present Freshman Class. It has been satisfying to be able to offer information and stimulation to these young high school students who in the past have frequently been afraid to apply to the Institute because of misinformation or lack of information. There are seven M.I.T. Educational Counselors in Houston, so each of us has a permanent assignment to two of the 14 Houston high schools. We are confident that the Educational Council has been a great help to the schools in this area by giving them the benefit of our somewhat wider experience in science and engineering at the college level."

D. K. "Mac" McNear, Assistant to the General Manager of Southern Pacific Company, replied: "Having worked for the Southern Pacific Company in various remote areas, upon my return to San Francisco (our head office) I was glad to have the opportunity to participate in the various Institute activities in the San Francisco Bay area. Becoming an Educational Counselor has brought back a very close and personal association with the Institute. Doing this work creates a deeper personal interest in the current functioning of the Institute, not only from a graduate level, but as seen through the eyes of a prospective student. It is most informative to interview prospective students, to realize their thoughts about recent scien-

tific applications which have advanced beyond those of some 15 years ago when we were making this initial step. Also, there is an inner satisfaction derived from actively contributing to the betterment of the country by helping to select qualified individuals to attend M.I.T. and obtain training which will serve to strengthen our nation in the future. For those fellow classmates who have not heard, or are not aware of Education Counseling, I highly recommend that they contact the regional director and offer assistance, if needed. It is a great pleasure to be associated with the Education Counseling group and to work with other Tech Alumni toward a common objective."

Milton R. Daniels, Jr., describes his modus operandi as follows: "I interview M.I.T. prospects from a large engineering preparatory high school, located in a middle Atlantic coast city. These boys represent the cream of the crop in a course of study that offers them mathematics up through integral calculus, surveying, strength of materials, heat engines, and so forth. Very possibly these boys start their engineering at too early an age, and with an inadequate view of the working world to guide them. Consequently, the current public craze for space travel and science has made its mark on the boys, and I spend some time during the interviews telling something about the working problems of an engineer. Some of the things I describe are the increasing dependence on government budgets, the engineer's future if too many people enter the field, the engineer's lack of control over his working conditions as contrasted with doctors and lawyers, and life in drawing rooms of ever-increasing size. But for all of that, the boys remain optimistic, and I suppose my inability to reach them is an age-old problem. Generally speaking, I enjoy the interviews. Some of the boys are obviously on the right track, and for the group as a whole, it is refreshing to meet people who are enthusiastic and have a choice to make in their futures."

John M. D. Walch enthusiastically endorsed the counseling program with the following response: "I consider my educational counseling one of the most gratifying activities that I participate in. It not only is stimulating to assist these young men and women to evaluate their educational potentials but it is really refreshing to associate with such a promising cross section of candidates as those who apply to the Institute. It is interesting to watch their individual progress and to evaluate your own reports and opinions. Most of these young people have taken the time to thank me for my help either by letter, phone, or a personal visit. It is realized that the future strength of our country is closely tied with the caliber of scientists, teachers, and leaders in industry, that our state, municipal, and private universities turn out. Since M.I.T. will continue to provide a good percentage of these future leaders, I enjoy the feeling of pride and accomplishment in knowing that I'm playing a small part in helping to provide the best 'raw material' possible to the Institute."

Shorter, but equally enthusiastic notes, were also received from Ezra Garforth, Jr., Vice-president in charge of sales in the steel mill division of Philadelphia Steel and Wire Corporation; and from Frank A. Jones, Jr., Vice-president of Cook and Company in Memphis, Tenn. Also helping our high schools was Dr. Holt Ashley, now Professor of Aeronautics at Tech, who recently addressed 1,300 high school students, relating civic responsibility to the astronaut program.

Gertrude S. Burbank, in addition to actively practicing as a registered architect, and bringing up four young children, also has helped the cause of education as former President of the South Street School P.T.A. in Suffield, Conn. An exciting first is credited to Dr. James Wong of Nuclear Metals, Inc., who produced the first successful extrusion of pure chromium metal tubing. Chromium metal in ductile sheet form might answer the designer's need of an ideal skin and structural material for high-speed aircraft and missiles.

We learned of the following promotions: Frank W. Heilenday was named Chief, Office of Operations Analysis, Strategic Air Command; James G. McCurdy was elevated to President and General Manager, Puget Sound Bridge and Dredging Company. Arthur E. Francis received an honorary doctorate of engineering from Stevens Institute of Technology. — HERBERT S. KINDLER, *Assistant Secretary*, 128 Elatan Drive, Pittsburgh 16, Pa.

'49

Our report on the 10th reunion last June is nearly ancient history. In any event, here it is. The 49'ers in attendance were as follows: Antonio Armenante, Jack L. Baker, Rodolfo Barrera, Ernest R. Barriere, John W. Barriger, William C. Beaton, Raffaele Belluardo, James K. Berman, Donal L. Botway, Robert D. Brown, Peter Cambourelis, Bruce Campbell, Stanley F. Collis, John M. Cook, Russell N. Cox, Charles Currie, Alexander V. D'Arbeloff, Francis P. Darcy, Richard B. Davidson, Noel Davis, Aldo C. DiMascio, Frank A. Dinneen, Jr., Ira Dyer, Earl W. Eames, Jr., Fletcher Eaton, Gates Falabella, Herbert M. Federhen, David D. Gaillard, 2nd, Donald L. Gillespie, James P. Gordon, Ronald L. Greene, Robert S. Griggs, George Gurley, William Haddon, Jr., Mitchell Halle, O. Summers Hagerman, Russell B. Hawes, David K. Hardin, Jabez S. Harford, Archie H. Harris, Willard F. Heintz, Henry L. Henze, Tom Hilton, Randall Hogan, Larry Holt, Charles W. Holzwarth, Hap Horn, John P. Horton, Robert E. Hughes, Frank T. Hulswit, Charles W. Jackson, William R. Jones, Harold E. Keene, Kenneth Kelton, Edward M. Kerwin, Jr., Robert L. King, John and Gerry Kunstadter, Malcolm H. Kurth, Edward R. Lady, Henry Lang, Robert J. Lannamann, Ray E. Larson, Mary C. Lavine, Robert Lincoln, Emmert M. Lowry, Jr., Joseph M. Lynch, Jr., Stanley Margolin, Francis L. Marran, John Marvin, Francis J. McCarthy, Robert McConaughy, Harold A. B. McInnes, Leonard N. McKibben, George McQueen, Howard L. Millard, William C. Mitchell, David C. Moore, Thomas Moranian, Russell L. Morris, Herbert L. Neitlich, Len Newton, Mariano Ospina, Parker Painter, Jr., Jan B. Peyrot, Dick Pitler, Howard A. Reuter, Paul T. Reynolds, Wally Row, Walter E. Seibert, Jr., Edward H. Somma, Herbert L. Spivack, John Stevens, Charles Sutherland, Robert P. Talambiras, Kemon Taschioglou, Tom Toohy, William Troy, Vernon P. Turnburke, Jr., Adrian P. Van Stolk, Emilio Jose Venegas, Robert S. Walton, Edward J. Walz, Jr., Paul E. Weamer, Thomas E. Weil, Richard H. Witherell, and Marvin D. Zimmerman.

During the banquet on Saturday night, Kemon Taschioglou presented a statistical report which is summarized here. The staff from the statistical department at Raytheon made an enormous chart to which data from the questionnaires were posted. This mass of data was then fed into an IBM 704 and was brought to the reunion by Tom Toohy.

There were 127 answers to the 10th-year questionnaire. Average age was 34 years; median age 33.2. Forty-eight 49'ers have received advanced degrees—5 LL.D.; 11 M.S.; 11 Ph.D. or Sc.D; 8 M.B.A.; 13 others. Since graduation, we have held, on the average 2.2 jobs. We have among us 7 presidents, 9 vice-presidents, 16 business executives, 44 engineering executives, 10 straight engineers (are there any crooked?), 6 teachers, 6 consulting engineers, 4 lawyers, 15 sales engineers, 4 self-employed. Less common jobs include one actuary, two architects, one market analyst, one chemist, one commander, U.S.N., one train master (manager of a train yard), two physicians, two consulting scientists, two housewives, one life insurance consultant, two drawing unemployment compensation, and two unemployed. Thirty-five were graduated from Course XV; 20 from Course II; 17 from Course VI; 9 from Course I; 8 from Course IX; 6 each from Courses X and VIII; 4 from Course XIII; 3 each from Courses IV, XIV and XVIII; 1 each from Courses III, V, VII, XII, XVI, and XX.

One hundred and five families have children — 139 girls and 135 boys, ranging in age from 1 month to 16 years. Twelve families have one child, 43 have 2, 29 have 3, 16 have 4, and 5 families have 5. One hundred fourteen '49er's are married. There are 13 bachelors — none of them confirmed. Of these, 22 are hunting (the committee announced it was somewhat confused by these figures which had been checked and double-checked). Ninety-nine members own their own home, 10 rent homes, 18 live in apartments; 21 live in urbia, 76 in suburbia, 2 in exurbia, 1 on an Army Base, and 1 "on the side of a hill covered with gorgeous tropical foliage, 12 miles from my office in San Juan."

Pets include 46 dogs, 23 cats, 2 canaries, 6 parakeets, dozens of goldfish, 8 turtles, 8 fish, 1 rabbit, 1107 tropical fish, 44 mice, 5 caterpillars, lots of ducks, 6 cows, 11 horses, $2\frac{1}{2}$ salamanders, 3.1×10^6 bees, 2 pigeons "on a window ledge requiring very little care," and 2 weevils (variety not known) "in a bottle with six flakes of oatmeal, on which they have subsisted for months; one is named Lemuel, name of the other remains to be determined." In addition, one landholder announced that his pets include "squirrels, deer, mosquitoes, earwigs, sowbugs, flies, spiders, and gophers."

At the conclusion of the statistical summary, awards were presented to a few of the more notable attendees. For some reason — we conjecture overindulgence on the part of the committee members — the records of these awards are less than satisfactory. Consequently, accuracy is not guaranteed. For least hair, a bottle of Kreml hair tonic — Bob Hughes. For most children (tie was broken by the largest age spread among the five children), earplugs — Ernest Ray Barriere. Traveled the farthest (there was some question as to whether to judge distance by great circle or actual miles; consequently, consideration was given to Rudolfo Barrera and Abraham Perez) — Art Van Stolk from the Netherlands was awarded the bird — a truly remarkable mechanical bird which flew by flapping its wings. For most degrees, a thermometer to Peter Cambourelis; youngest child, rubber gloves — Vernon Turnburke and wife Lynn (child three weeks); most jobs, compass (because he needs direction) — anonymous classmate from Course XV who has held 8 jobs since graduation (now on a farm); confirmed bachelor, address book — Bill Mitchell. (Address book was passed around so that other members of the Class could enter the names of their daughters in it.) A special award of a safety razor was given to Bob Walton, who had grown a beard for the occasion and came dressed as a real 49'er. There is some question as to whether or not a tape measure was awarded to Bill Jones for the largest weight gain. There is also a vague recollection that a mirror was awarded to someone for having the most daughters, and a leash to someone else for having the most unusual pets, including snails and boll weevils.

Bill Green gave an entertaining and warmly received speech on "M.I.T.: Past, Present, and Future," at the banquet. The reunion committee presented him with a gift following his speech. The committee had appointed a "Bill Green Gift Committee," which made a survey, interviewing members of the M.I.T. Humanities Department, the heads of various professional and intellectual societies in Cambridge, and others who shall be anonymous, for suggestions for a suitable gift. Since no good suggestions were uncovered (some were suitable but unsatisfactory) the committee went to Mrs. Green, who recommended two paintings of ancient Greek ruins as being dearest to Bill's heart. In receiving the gift, Bill noted that these scenes were respectively Kemon Taschioglou's birthplace, and where his father met his mother.

Dave Hardin wound up the banquet by projecting slides from the 1949 *Technique* and current pictures taken at the reunion with Polaroid Land transparencies. Dancing and square dancing followed. Other activities during the reunion weekend included golf; swimming; a baseball game with Margolin versus Margolin on the mound — the results of which are shrouded in beer fumes; an outdoor luncheon buffet which was nearly, but not quite, rained out; nearly continuous operation of the gambling tables; bridge games; and several seminars, including one on how to get a new job, led in part by Archie Harris, who has since utilized the know-how gained therein to do just that, and another on running your own business. In addition to all this, some dastard kept drilling holes in the liquor bottles, with the result that the well actually ran dry before the weekend was over. All in all, it was a most rewarding affair for those who attended. It's lucky we don't do it on this scale more often than every five years!

Steinhardt and Thompson, Architects (Rolland D. Thompson) were chosen to participate in the annual "Art and Interiors" Exhibit at the Midtown Galleries in New York City. Each year the directors of the Midtown Galleries invite six American designers to illustrate the use of contemporary American art. The exhibit was featured in the September issue of *Interiors* magazine, and will probably be covered by *House and Garden*. Steinhardt and Thompson's entry, a reception area for office or home, was selected by the *Herald Tribune* to illustrate its article on the show. Steinhardt and Thompson were the architects of the very unusual "Restaurant on the Mountain" at Suffern, N.Y. E. Milton (Edmund M.) Bevington has been appointed manager of the Trane Sales Office in Atlanta, Ga. Trane is a leading manufacturer of air conditioning, heating, ventilating and heat transfer equipment in LaCrosse, Wis.

Jack H. Westbrook received the Richard L. Templin Award from the American Society for Testing Materials. Marvin A. Asnes was married on September 27 to Miss Norma Joyce Ketay in New York City. Since graduating from M.I.T., Marv has attended the Harvard Graduate School of Business Administration, where he was a Baker scholar and a research associate. He also served as first lieutenant with the Air Force. Robert D. Brown was appointed in August as planning director of the Capitol Region Planning Authority in Hartford, Conn. Bob received a B.S. in Civil Engineering in 1949 and an M.S. in City Planning in 1951. Since 1952, he has been associated with Frederick P. Clark and Associates, Planning Consultants, of Rye, N.Y. The Capitol Authority will deal with problems of development which affect all of the 22 municipalities of the Hartford area, such as primary highways, major recreation areas, land use and zoning inconsistencies at municipal boundaries.

Major Richard Erlenkotter (M.S., Civil Engineering) was named in September as area engineer of the Providence area office of the U.S. Army Engineering Division, New England. Dewey and Almy announced in August the appointment of Van T. Boughton, Jr. (M.S., Chemical Engineering) as manager of its home plant in Cambridge. He was formerly manager of the process development department, since 1958. He joined Dewey and Almy in 1949 and has served as chemist and process development engineer. — FRANK T. HULSWIT, *Secretary*, 14 Nadine Road, Saxonville, Mass.; STANLEY V. MARGOLIN, *Treasurer*, 215 Grove Street, Auburndale 66, Mass.

'52

Only a month has passed since we yelled for help in getting items for this column, and already over 200 of you have sent back either the brief questionnaire or a note. Incidently, a fair number of you asked me if I had an up-to-date address on a particular classmate; best bet on this is by writing directly to the Institute Alumni Register, although where I have an address I'll try and mail a post card. If you dropped me a note, and no mention is made this issue, it will be because I'm trying to take these in the order they came in, and there is enough material here to write several columns.

Wedding announcement just received of the marriage of Esther Henny Ramsland to Newell Trask, Jr., in October, in Denver, Colo.

Edward Matthews and James John Pappas have joined the staff of Esso Research and Engineering Company. John F. Connolly is a senior project chemist, Whiting Research Laboratories, Standard Oil of Indiana. Dr. Mark J. Beran is now at Technical Operations, Inc., in Burlington, working on studies dealing with radiation spectrum of nuclear weapons. (Doctorate in 1955 from Harvard in applied science.) Bernard J. Alperin was appointed manager — product engineering for the Everett Foundries of the General Electric Corporation. Nathan Sivin is still at Harvard as a graduate student in history of Chinese scientific thought on a Ford Foundation regional training fellowship. Taj F. Hanna is living in Brevard, N.C., and working at DuPont's Hyperpure Silicon Plant. Taj extends the invite to anyone passing through the South to stop in and visit. Taj is married and reports Linda Jean three and a half years and Robert one and a half years.

Jim Brownell is working for Rheem Manufacturing Company, Chicago, and living in Park Forest, Ill. He is a national product manager, air conditioning, and gets together with Ed Davis manager, air conditioning engineering for Rheem, and Joe McCarthy, research engineer for Rheem. He also writes that Art Swanson is in the sports car set on the French Riviera (sounds interesting) and that Paul Valentine and wife recently toured the world on a tramp steamer. Jim is married to the former Sally Jane Cummings from Wakefield, Mass. — and is the father of one son, Stephen, age two and a half. Lieutenant Commander Claude F. Martin, Jr., USN, writes he is with Bureau of Naval Personnel in Arlington, Va., placement officer placing uniformed engineers in the various navy technical bureaus, labs, shipyards, and so forth. Also mentioned there are a lot of '52'ers around Washington.

Howard K. Larson is living in Cupertind, Calif., working for National Aeronautics and Space Agency, Moffett Field, Calif., as an aero research scientist project leader in separated flow, aerodynamic heating, and melting ablation studies, and has delivered a paper "Heat Transfer in Separated Flows" at Institute of Aero Sciences in New York, January, 1959. Allan Tanner is working for the geophysics branch, U.S. Geological Survey, in Salt Lake City, as a geophysicist investigating the behavior of radon in natural environment and its application to geological problems. He is also doing work for the National Cancer Institute on natural radioactivity as the possible cause of cancer. Allan has delivered a paper at the second international conference on peaceful uses of atomic energy, Geneva, 1958,

and has been published in *Mining Engineer* in July. Bill Morse is with North American Aviation, Inc., in Columbus, Ohio, as an engineering test pilot. He has a wife and three children.

H. Stuart Muench of Arlington, Mass., is working for Air Force Cambridge Research Center at Bedford Airport as an atmospheric physicist investigating circulation in the upper atmosphere. He was married in Switzerland in January, 1959, to Elizabeth G. Holt of Georgetown, Maine. He writes that Wayne Mount, Fred Ward, Al Thomasell, and Duane Haugen are all working for Air Force Cambridge Research Center. Dirk Plummer is with Aerojet-General Corporation in Azusa, Calif., as a development engineer, in the astronautics lab, working on advanced propulsion systems in the chemical rockets technology division. Bill Carson is with Ramo-Wooldridge Division of Thompson Ramo Wooldridge in Chatsworth, Calif., on the systems engineering staff of the data systems project office. John Prizer is at Ainsworth Precision Castings Company, Detroit, as manager of the pricing department. He was married in August, 1958, to Margaret Rinehart of Webster Groves, Mo.

Bill Hoey is a city planner for the Bureau of Municipal Research, University of Oregon, Eugene, Ore., and writes he ran into Bob Roy in Seattle. Bob is working for Port of New York Authority. Howard Zasloff is still with Lummus Company in New York as an engineering specialist, central management group. Robert Damon is in Alton, Ill., with Olin Mathieson, energy division, as an applications engineer in the field of solid propellants for rockets and missile auxiliary power. He is second vice-president of the St. Louis section of American Rocket Society, and also active in the local American Institute of Electrical Engineers. Gerry and Anita Laufs are now living in Short Hills, N.J., and Gerry is working for Standard Oil of New Jersey in New York City as an engineering analyst. Gerry mentioned that Bob Frey attended Harvard Business School and is now working for American Metals Climax. Bruce Curry is now with RCA, as systems manager, Cleveland, Ohio, office.

Dick Baker writes he was married to Sarah Boyd Dickenson on August 29, 1959, at Lake Geneva, Wis. Dick is a sales engineer plus show manager for four national shows per year for the Bartelt Engineering Company of Rockford, Ill. Joseph Tache is working for Chrysler Corporation in Detroit, Mich., as laboratory supervisor of the cast metals lab. Burt Green is living in Deal, N.J., and is a field engineer for Transitron Electronic Sales Corporation of Newark, handling Long Island, Brooklyn, and Bronx semi-conductor sales. He is married and has two children. Nick Haritatos is living in Berkeley, Calif., and is working for California Research Corporation, a subsidiary of Standard Oil of California, in Richmond, Calif., as a research engineer in the process and plant design division. Writes that the work has been diverse and interesting. Nick is active in the American Institute of Chemical Engineers, and mentions he sees Bob Bacastow, doing graduate work in physics at University of California, and Bill Mitchell, who is also at California Research Corporation. Dan Lufkin is at Scott Air Force Base, Ill., as a captain and assistant chief of the Technical Services Branch, working on uses of the satellites in military meteorology, and had a paper on water vapor divergence in the M.I.T. General Circulation Project Series.

Dudley Hartung is living in Weston, Mass., working for Sanders Associates, Inc., in Nashua, N.H., as product manager of hydraulics. He has one son, Paul Dudley Hartung, born September 17, 1958. David Kosowsky is with Hermes Electronics Company, Cambridge, as director, crystal filter division. Leon Polinski is with the Polytechnic Institute of Brooklyn as a research assistant doing work on an Air Force project and writing a paper. Dan Lycan wrote a very nice letter giving a run down on his activities since M.I.T. — he has been on active duty in the Corps of Engineers, regular Army, and is now a captain; had a tour of duty in Germany, then did graduate work in structural dynamics at the University of Illinois; got an M.S. in January 1959 and is working currently on a Ph.D. dissertation in absentia. Presently, he is at the Army Engineer Waterways Experiment Station in Vicksburg, Miss., as military assistant on research and development projects, covering effects of nuclear weapons on waterways, structures, and terrain. He married Alice Finan, of Pawtucket, R.I., in September, 1955, and has one daughter three years old. Herbert Lebovitz is with Modern Transfer Company in Allentown, Pa., as assistant to the president, and also a graduate assistant in math at Lehigh University. Chuck Sorensen is with Knolls Atomic Power Laboratory in Schenectady, N.Y., as an engineer on the power plant for a nuclear powered destroyer being built in Quincy, Mass. He and Christine have a two-year-old daughter, Sylvia. Irwin Grossman is president of the Fairway Company, General Contractors, in Dallas, Texas. Sarkis Zartarian is with Tracerlab on Route 128 in Waltham, Mass., and has just been promoted to assistant sales manager of the X-ray division in charge of all branch offices. Edward Fox is with Lincoln Anthracite Company in Pottsville, Pa., as vice-president in charge of anthracite coal cleaning and sizing plant.

Marty Kay is with American Machine and Foundry in Stamford, Conn., as a servo design group leader for missile launchers, antennae, tracking mounts, and so forth, and is living in Norwalk. Joe Gaven is back at M.I.T. working for his Ph.D. in Physical Chemistry. George Mellor is an assistant professor of mechanical engineering at Princeton University, and has been published twice in the American Society of Mechanical Engineers *Journal*. Also, his first son was born May 25, 1959. Edgar B. Gutoff is with Ionics, Inc., in Cambridge, as senior chemical engineer in the research division. He presented a paper before the American Institute of Chemical Engineers' national meeting, St. Paul, September, 1959, on "Effectiveness of Mixing Tanks in Smoothing Cyclic Fluctuations." Howard Fawcett is working for Newport News Shipbuilding and Dry Dock Company as a staff supervisor, steel hull division. He is also treasurer of the M.I.T. Club of Virginia Peninsula, which he had a part in organizing. Howie writes that in his spare time he has been doing a bit of yacht design and brokerage, plus the usual amout of sailing, of course. Jim Stolley is in Hamilton, Ohio, with the Beckett Paper Company where he is assistant general superintendent.

Well, this seems to be a full column's worth. Thanks again for the many letters, and also your general response to the questionnaire. At the rate they are coming in I won't finish them up for a few months. Enough of you commented on the ease of a blank to fill in, so we'll probably do the same next year. Best to all for 1960.— DANA M. FERGUSON, *Secretary*, 252 Great Road, Acton, Mass.

'53

Latest doings of classmates. . . . Robert Youden is now group head for applications engineering at the Sperry Semiconductor Division, and will supervise development of new applications and the analysis of special customer requirements for silicon transistors, diodes, and rectifiers. Prior to joining Sperry in 1954, Robert worked as a research engineer in the Dynamic Analysis and Control Laboratory here at M.I.T. He and his wife, Cecelia, have two children and are living in Norwalk, Conn. Last month I reported that Paul Shepherd received a promotion, though specific details were not included. He has been appointed an associate of the newly formed Cabot, Cabot and Forbes Associates, Inc., of Boston. The new corporation was formerly the engineering division of Cabot, Cabot and Forbes Company. Its projects will include site engineering, building design and engineering, for C.C. and F. clients, as well as independent contracts.

In September Martin Levine and Marilyn Goldberg were married here in Massachusetts. He completed both his B.S. and M.S. at Tech, and she is a graduate of Fisher Junior College. Robert Joslin, a '53-G classmate, who received his doctorate at M.I.T., has been nominated for the position of Alumni Member on the M.I.T. Corporation Visiting Committee for the Department of Food Technology. Rolf Nordheim, who also completed his doctorial studies at Tech in 1953, has recently joined the research division of Jones and Laughlin Steel Corporation as senior research engineer in the process metallurgy section. Prior to this change, Rolf was supervisor of physical metallurgy with the Norwegian Defense Research Establishment. He is the author of several technical papers dealing with high temperature alloy development, and has served as President of the Norwegian Metallurgical Society from 1957 to 1958.

May I close these class notes by way of making a strong plea. Just as your class secretary has the responsibility of collecting and reporting current news, each of you has an equally important responsibility; and that is to provide your secretary and therefore your classmates with up-to-date information on you, your family, and your professional life. Just as you are interested in the rest of the Class, the *rest of the class is interested in you.* I will faithfully report all the news I can buy, beg, steal, or borrow . . . but I can't manufacture information that you do not send

me. So please drop me a line every six months or so. Many thanks. — MARTIN WOHL, *Secretary*, Room 1-131, M.I.T., Cambridge 39, Mass.

'54

High on our list of New Year's resolutions is a promise not to miss any more issues of The Review with our monthly column. We are keeping our promise this month, but in an unfortunately brief way; we are still in the throes of moving half way across the country at the request of Uncle Sam. By next month, we should be able to do better.

Our new leader, Bob Anslow, sends his inaugural greetings to the Class, wishing all of you the best for the next five years, and hoping that promotions come fast. Bob also wants to: "thank the Class for the help and support that I received as reunion chairman. I hope that it will continue for at least the next five years."

We have a few more news items gathered at the reunion. Wally Boquist is a physicist with Allied Research Associates of Boston. Fred Bowis is working with the Chevy Chase Chevrolet Company in Maryland. Bob Anslow, Wade Brown and Dave Myers are all with Raytheon. Bob is the planning manager for the equipment and systems division; Wade is hydraulic engineer at the Wayland Laboratory, and Dave is designing missiles in the missile systems division. George Dormer is in the investment banking game with Solomon Brothers and Hutzler in New York City. Al Lett is a staff engineer at IBM. Our Vice-president, Chuck Masison, is a senior engineer with Sylvania Electric in Needham, Mass. Stan Wolk is a superintendent in the optical department of Pittsburgh Plate Glass Company.

On the social side, we note that Dick Hayes and his wife Ellin threw a most enjoyable party on November 15, in their apartment in Wollaston, Mass. Among the gay participants were Larry Leonard, Rog Griffin, Dick Morley, Fran Selvitelli '55, and your peripatetic secretary, each with wife in tow. All of the above are currently in the Boston area on various pretexts, details of which will be reported as soon as they are discovered. — EDWIN G. EIGEL, JR., *Secretary*, 3654 Flora Place, St. Louis 10, Mo.

'55

News seems to be as scarce as a 5.0 cum this month, so we shall have to be satisfied with a short column. Dell sent me a note with a single news item to start the ball rolling, but it never gained much momentum.

I spent an enjoyable evening at the home of Lenny and Judy Wharton discussing Len's plans as co-chairman of the reunion committee. We all hope that by the time you read this you will have received a letter from the committee describing the big "Jolly-Up" in June. In addition to the request for class dues to help defray reunion expenses, a return card will be enclosed. We would love to see all your return cards arrive with the "Yes, I shall come to the reunion" box checked off, and the space for class notes information just chock full of newsy items about yourself and other '55ers.

Lenny is studying for a Ph.D. in chemical physics at Harvard, while Judy is teaching school in Newton. He mentioned that Al and Eileen Schell have just added Alice Rosalind to their household. Al is still in uniform at the Air Force Cambridge Research Center. He plans to return to M.I.T. for the Sc.D. upon separation. Len received a beautifully engraved announcement of the association of Eldon Reiley with the law firm of Paine, Lowe, Coffin and Herman in Spokane, Wash.

In September, Don Steig was married to Janet Barbara Feldman of the Columbia School of Library Sciences, and Brooklyn, N.Y. After leaving Tech, Don studied at Columbia where he received a master's in chemistry. He is now an engineer with the electronics division of the Curtis-Wright Corporation. — MRS. J. H. VENARDE, *Secretary*, 107 Mullin Road, Wilmington 3, Del.; L. DENNIS SHAPIRO, *Assistant Secretary*, 15 Linnaean Street, Cambridge 38, Mass., ELiot 4-4901.

'56

A Happy New Year to all as we move from the Frantic Fifties into the Screaming Sixties! The majority of the news which has come in during the past month has concerned those who are moving from one place to another. Fred Baum is now out of the army after serving two years in such diverse places as France, Germany, Lebanon, and Turkey. He is working for Leeds and Northrup in New York, and also studying for a master's degree at night at Rutgers. Another escapee from military service is Arnold Breeden, who saw duty with the Air Force in Illinois, Texas, and Guam. Arnold is back with the Glenn Martin Company in Baltimore. Frank Foster, on the other hand, has just left Baltimore and gone to San Diego, where he is employed by the National Steel and Shipbuilding Company.

The University of Michigan currently boasts a small contingent of Techmen working towards their doctorate in chemical engineering, including Phil Birbara, John Cowles, and Tom Boberg. Tom writes that he married Carol Jean Cook of Flint, Mich., in September, 1958, and plans to work for the Jersey Production Research Company in Tulsa, Okla., after graduation in February. Marriage still seems to be a popular activity among the Class. Phil Whitney was married to Marjorie Dixon of Taunton, Mass., recently. In addition Richard Kelly married Joanne Donovan of Dorchester, and David McBride wed Jean Low of Chestnut Hill.

Don Block, now working for the Packard Bell Computer Corporation in Los Angeles, reports the birth of a son on October 30, 1958.

Our frostbitten secretary, Bruce Bredehoft, writes that winter has set in without question in Alaska, but that he will be back in warmer climes (I almost said back in the States, but remembered that Alaska is now one of the great 50) in early February. — LT. BRUCE B. BREDEHOFT, *Secretary*, AO 306 7617, Box 108, 626th AC & WRON, APO 701, Seattle, Wash.; M. PHILIP BRYDEN, *Assistant Secretary*, 3684 McTavish Street, Montreal 2, Quebec, Canada.

'57

Alan Kotliar writes in part as follows: "After getting degrees in Courses II and VI (Course VIII, the hard way), I went to the Wharton School for an M.B.A. degree. Got that last June and am now back in Cambridge as Assistant to the President of Hermes Electronics Company. We're a 300-man consulting, research and engineering company in the digital, communications, physics, antenna, and crystal filter fields. Barney Weinstein, VI, is also here at Hermes. Others in the Boston area include John Reed, II, who is at Polaroid, has a baby daughter and another on the way; Lionel Fray, VI-A, who is back in Boston at Mitre after having spent several months in Montgomery, Ala.; Mike Schneider, VI, at Harvard getting his Ph.D.; and Hal Miller, II, an Air Force lieutenant in the Rome, N.Y., project office, who visited Hermes recently and said that Bill Fleischer, II, was a sales engineer for Ingersoll Rand in upstate, New York.

"John Rinde, II, got married recently and is somewhere in New Jersey. Mike Pick, II, recently visited Boston — he's with Grumman in New York. Paul Coble, VI, is in the patent field in Washington, D.C., and is getting his L.L.B. Russ Peirce, XIX, started on a master's in electrical engineering at the University of New Hampshire." Incidently, Alan also mentions that he'd like to hear from any of you fellows who are interested in good employment opportunities in his area.

Recently attended an engagement party for Hank Salzhauer and Sue Druck. Hank is out of the Army and back in New York. Wedding bells on December 27. Among those at the party were Mike Falk, who is now in the service; Don Roellke and Bill Alexander, who are both at Tech. Around Manhattan, Bob Gal and Jack Safirstein are roommates on the West Side. Bill Leach has an apartment in the Village and is with McGraw-Hill. Art Schultz, on the East Side, is with St. Regis Pulp and Paper.

Marriage continues to be of prime interest to our Class. By the time news of the following weddings appears in print the principals may feel like long-married folks, but our belated congratulations are sent nevertheless. On June 13, Robert Van Benschoten and Lorna Purdy were married. Bob had recently received his master's degree from Amos Tuck School of Business Administration and is now on the staff of IBM. One week later Demaris Smith became the bride of Dick Knapp, who is attending the graduate division of Rensselaer Polytechnic Institute. John Pacinda was an usher at the ceremony. The marriage of Hamilton Southworth, Jr., now with Sperry Gyroscope, and Eleanor Ewart took place on June 18.

Nuptials were held on August 16 for Herbert Heller and Naomi Tandet. Doug-

las McIver was married August 22 to Allegra Lynne Kraft. He is now working for the Sperry Corporation on Long Island. The wedding party included John McAllister, Bill Brandon, Hank Cutler and Joel Searcy. The following day saw the wedding of Perry Goldberg to Jetta Eisinger. August 30 was the wedding day for Phil Pearle and Betty Cooper.

Labor Day morning witnessed the marriage of Bob Laurence and Carol Jolicoeur. Bob is currently a graduate assistant at the University of Rhode Island. On September 12 Eric Johnson married Beverlee Guild. Clair Nielson was best man at the ceremony. Eric is completing studies for his doctorate at the Harvard Graduate School of Physics. The same day Jay Hammerness was married to Sarah Graves. Mal Jones was best man; the ushers included John Day, Don Corrigan, Stan Kroder and Steve Weisskoff. — ALAN M. MAY, *Secretary,* 525 East 81st Street, New York 28, N.Y.; MARTIN R. FORSBERG, *Assistant Secretary,* 11 Scottsfield Road, Allston 34, Mass.

'59

I hope we have all contributed in our own way toward bringing in the New Year successfully. Any interesting stories, factual or fictional, will be greatly appreciated. Let's remember that New Year's resolution to write faithfully. If you write small, even a post card will be accepted. Don't be discouraged if any news you contribute doesn't make the next month's class notes section. The M.I.T. Alumni section seems to be the largest in the country and articles are due about two months in advance of actual publication. Which reminds me, I have several more wedding announcements from our classmates. All, I believe, have taken place since graduation: Owen Evans to Roberta Fagan (Owen is now working for Sikorsky), John Upton to Deanne Scheller, Alf Jacobsen to Paroohy Getzoean, Joe Canny to Marie Reissfelder, Ken Baker to Carol Parker, Jim Piper to Karen Breed (Jim is studying at Emory University), Bob Dix (now working at AVCO Research Center) to Gretchen Van Note, and Ken Taber to Priscilla Colpitts (Ken works for Beryllium Corporation).

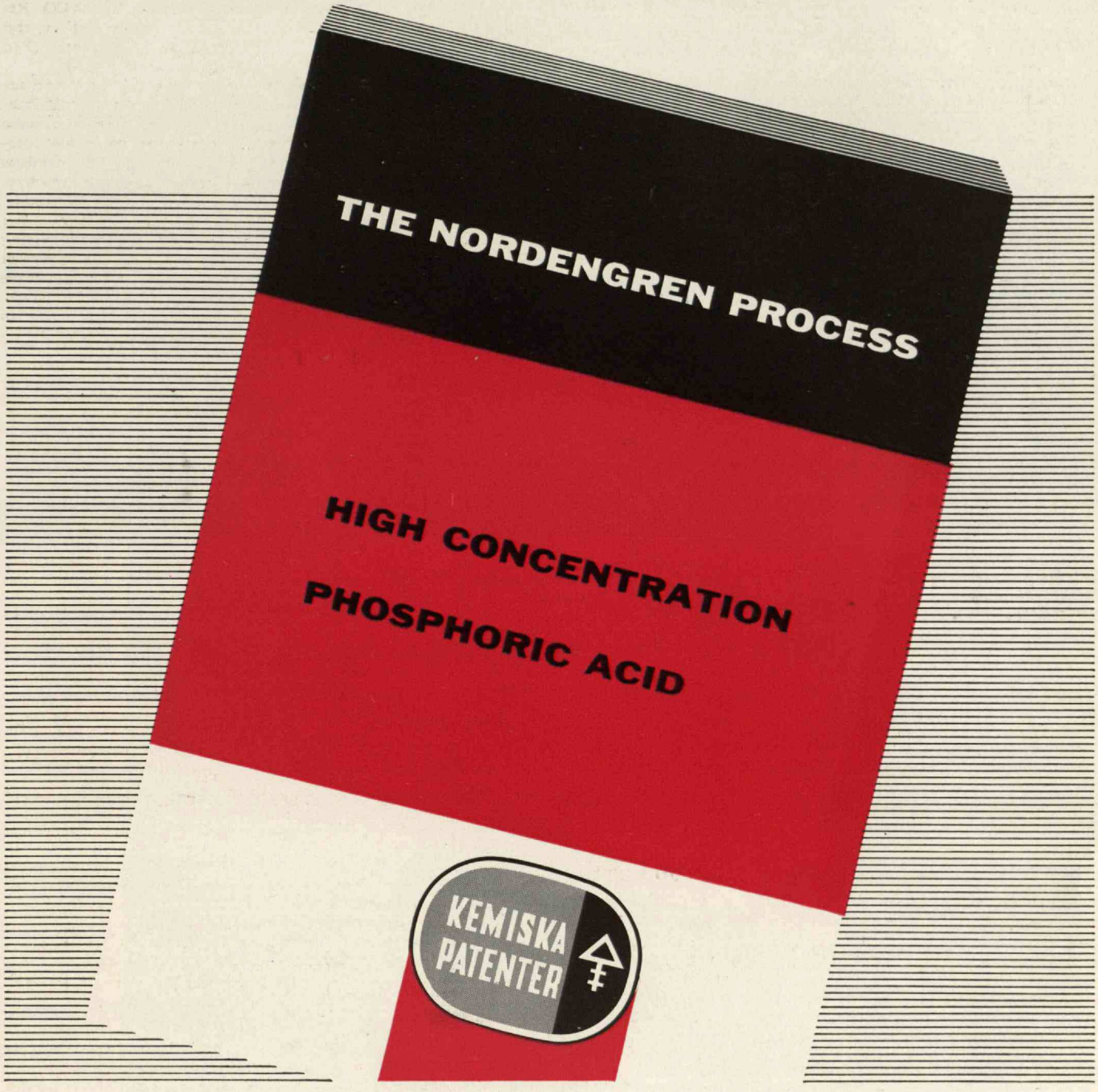
Visited Boston in late October and arrived just in time for a good old-fashioned Sigma Epsilon Chi party. I presume most of you remember the S.E.X. parties. Apparently, many of the members are still in the Boston area and are carrying on in traditional fashion. Naturally, Glenn Zeiders was present. Many other notables helped to keep the party moving at a rather brisk pace. They included Chuck Staples, Dick Sampson, Dave Packer, Al Oppenheim, and Phil Beach. It was fun. — ROBERT MUH, *Secretary,* 8 Merrivale Road, Great Neck, N.Y.

M. I. T. on TV

Some of the recent activities at the Millstone Hill Radar Observatory of M.I.T.'s Lincoln Laboratory will be featured in "Conquest," a weekly series of science programs telecast by the Columbia Broadcasting System, with Charles Collingwood as the host-narrator.

A large part of the program entitled "Waves of the Future" in this series was filmed at Millstone Hill, and a transatlantic "moon-bounce" to England's famous radio observatory at Jodrell Bank is featured. In another portion of the program, filmed at Lincoln Laboratory, Dr. Carl Overhage, Director of the Laboratory, describes some novel applications of radar.

The "Conquest" series is shown in many parts of the nation on Sunday afternoons. The series started in New York on November 1 and will start in Boston in January. "Waves of the Future" will be on the air at various times in various places during January, February, and March.



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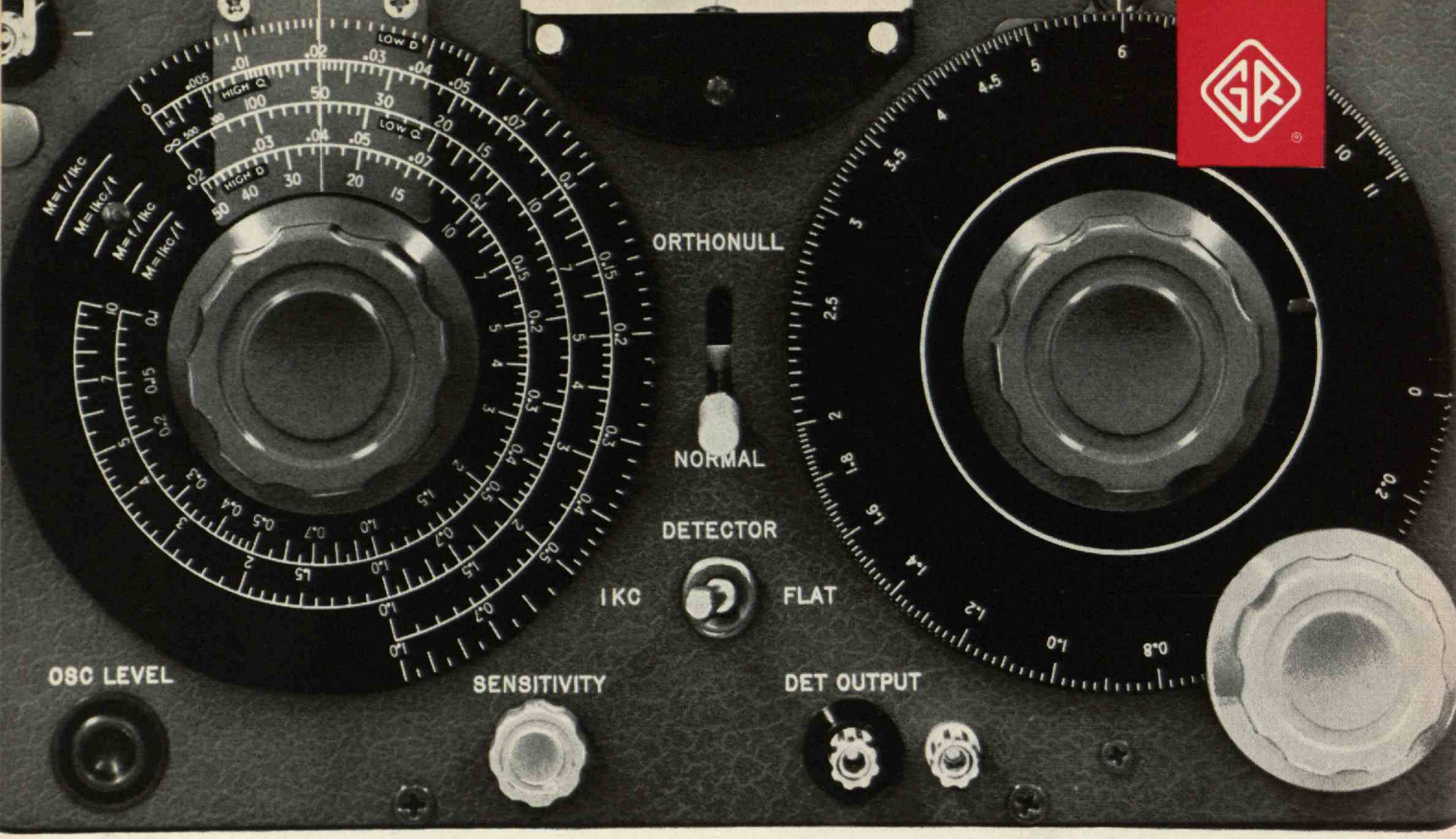

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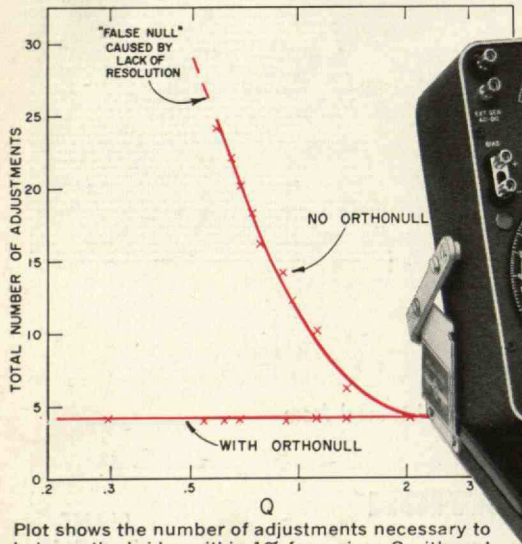
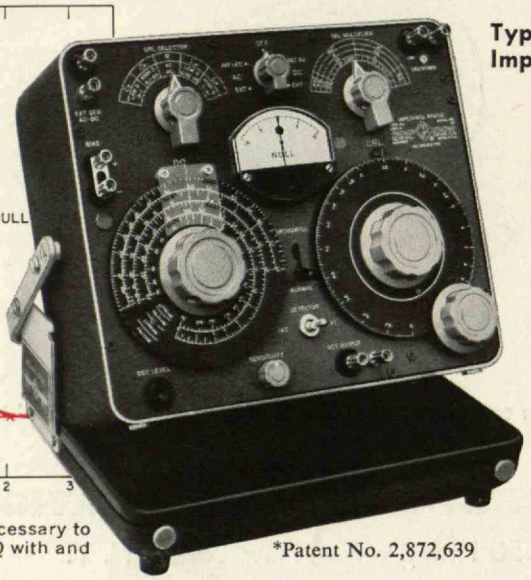


Plot shows the number of adjustments necessary to balance the bridge within 1% for a given Q with and without Orthonull.



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